GARDNER ON THE WORLD BRAIN • THE CASE OF THE PETRIFIED GIRL • MULTIPLE PERSONALITY DISORDER

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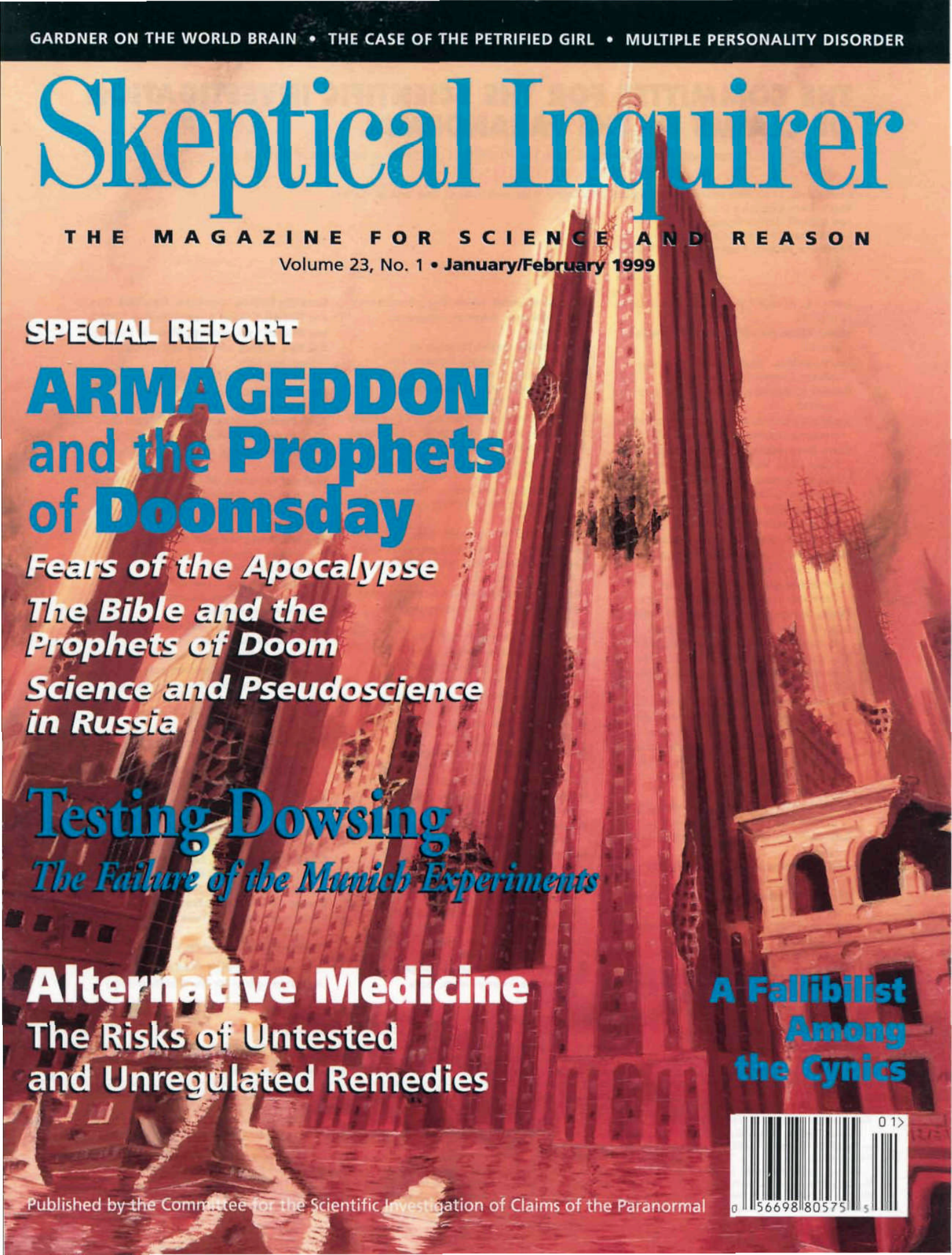

SPECIAL REPORT

ARMAGEDDON and the Prophets of Doomsday

Fears of the Apocalypse

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Science and Pseudoscience in Russia

Testing Dowsing

The Failure of the Munich Experiments

Alternative Medicine

The Risks of Untested and Unregulated Remedies

A Fallibilist Among the Cynics

Published by the Committee for the Scientific Investigation of Claims of the Paranormal

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Illustration by Brad Marshall

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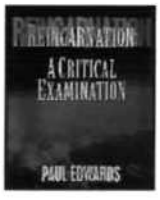

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EDITOR'S NOTE

Armageddon and the Prophets of Doomsday

The end of the millennium, by the way most people will define it, is only a year away. For the great majority of people, I think (hope?) the transition to the year 2000 will be a time for celebration, contemplation, and anticipation of the future. For others it is a harbinger of dread. I myself had expected more outbreaks by now of what we might call "millennial madness," of the kind we saw with the Heaven's Gate *comet-stimulated* cult suicides. Perhaps we will be spared the worst. Nevertheless there is still much time for contagions of human hysteria and superstition to express themselves.

There have always been those who believe, regardless of the time in history, that Doomsday is near.

In this issue we open with Paul Kurtz's "Fears of the Apocalypse: The Escape from Reason," the opening talk at the opening session ("Millennial Prophecies") of the CSICOP-sponsored Second World Skeptics Congress in Heidelberg, Germany, July 23–26, 1998. The Congress's overall theme was "Armageddon and the Prophets of Doomsday." The founding chairman of CSICOP, Kurtz applies his broad outlook as a philosopher to the question of how we look to the future, and distinguishes three kinds of forecasts of Doomsday prophecies: *secular* predictions (those related to the economy, the environment, resources, population, war), *religious-based* predictions, and *New Age cult* predictions. It's a useful set of distinctions as we head toward the millennium-turning moment. As he emphasizes, those committed to skeptical inquiry have an obligation to carefully examine all claims about our collective future and submit them to empirical criticism.

We follow that with another conference paper, Gerald Larue's "The Bible and the Prophets of Doom," which traces the evolution of end-of-age and apocalyptic notions in religious scripture, including how apocalyptic thought developed and how modern proponents intepret it. Larue is emeritus professor of biblical history and archaeology at the University of Southern California.

* * *

One of Russia's prominent scientific statesmen, Sergei P. Kapitza, presents a sobering assessment of the state of science and of pseudoscience in post-Cold War Russia. The article is based on his talk at the Heidelberg congress. The article is followed by the text of a statement by thirty-two prominent Russian scientists and philosophers on the need to combat pseudoscience.

* * *

Every time we've published a critical mention of dowsing in the past few years, I have heard from people who cite recent experiments funded by the German government and conducted by a group of German university scientists (Wagner, Betz, König, and others). These experiments were said to have found strong empirical support for dowsing. Is that true? J.T. (Jim) Enright, a professor of behavioral physiology at the Scripps Institution of Oceanography, has devoted extensive investigation to that question. The German experiments, although conducted by proponents, were generally well designed and represent the most extensive tests ever conducted of the hypothesis that dowsers can detect hidden water. But Enright comes to a surprising conclusion: When *all* the data sets, in contrast to only those emphasized by the authors, are analyzed and plotted, the experiments not only fail to present convincing evidence of dowsing, they "provide the most convincing *disproof* imaginable that dowsers can do what they claim."

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World's Longest Firewalk: Physicist Leads Hot Trek for Science in Pennsylvania

David G. Willey's 165-foot fire bed at the University of Pittsburgh at Johnstown.

"It's not mind over matter," he explained into the BBC television camera, "It's mind *in* matter." This gentleman, along with fourteen others, had just set the world record for the longest walk across hot coals. Interviewers asked the firewalkers to explain how they could trod upon burning embers without injury, and some replied with descriptions of the needed mental and spiritual discipline. Other participants, however, provided a different account of their success—one in which mind didn't matter at all.

Indeed, that was the position of the organizer of the event, David G. Willey. Willey is an instructor of physics at the University of Pittsburgh at Johnstown and a veteran firewalker. His explanation for how walkers like himself avoid painful burns relies not on psychology but on basic physics:

> "A firewalk of short length is something any physically fit person could do. It does not need a particular state of mind. Rather, it is the short time of contact and the low thermal capacity and conductivity of the coals that is important."

Willey supports a version of the hypothesis, posited by Bernard Leikind and William McCarthy (SKEPTICAL INQUIRER, Fall 1985), that firewalking can be understood in terms of elementary thermodynamics. While the coal bed may reach extremely high temperatures, it still takes time for heat to flow from the coals to the flesh, and different materials conduct heat at different rates. Indeed, substances like hardwood, charcoal, ash, and human skin are good thermal insulators, allowing heat to pass through them only slowly. Since, during a brisk firewalk, each foot is in contact with the coals for only a short time, little heat is transferred and little damage is done.

As an analogy, consider reaching into a hot oven to touch the surface of a cake. Everything in the oven is at the same temperature, but neither the air in the oven nor the cake cause burns, if touched only briefly. Touching a metal pan, however, will lead to injury, since most metals are excellent conductors of heat.

In order to investigate this theory, and in hopes of educating the public, Willey staged the World's Longest Firewalk event on July 2, 1998, on his home campus in Johnstown, Pennsylvania. Prior to that evening, the longest continuous fire bed crossed by bare feet was a 120-foot path braved by Jim Jarvis, Dan McHale, and Sara Raintree on October 10, 1987, in Redmond, Washington. Willey's goal was to walk at least 150 feet before leaving the coals, but the actual length of the constructed lane was 165 feet. The fire bed began as about eight cords of wood stacked over a yard high. This pyre was lit around 7:30 P.M., producing a spectacular wall of flame, uncomfortably hot even from thirty feet away.

Several hundred spectators had gathered, and a number of television camera crews circled the site. Interviewers from the BBC, the Discovery Channel, and ABC's *20/20* were all on hand. A fire engine and ambulance were parked nearby. The onlookers waited impatiently for the firewalking to begin. Indeed, Richard Busch, a skeptic and experienced firewalker who had come to observe the event, worried aloud whether pressure from the media might drive the walkers onto the coals too soon.

Around 9 P.M., Willey finally addressed the crowd and began an initial demonstration using a five-foot-long fire bed that had been ignited much earlier. After the coals were raked to flatten the surface, Willey crossed the short path to the cheers of the crowd. A local weather reporter also braved the fire bed, preceded by Pennsylvania Senator John Wozniak. Even ABC News correspondent John Stossel joined in, making a quick trip down the hot path. (Stossel's one-hour special, "The Power of Belief," telecast on ABC October 6, 1998, prominently featured the Willey firewalk demonstration.)

After more than three hours of burning, the wall of flame on the 165-foot fire bed was finally beaten down to

Michael McDermott walks a 165-foot fire bed.

glowing coals, with a thin strip of wood left theatrically flaming between the walking lane and the audience. Thermocouple pyrometers were placed deep within the coals. Mike Allison, an assistant to Willey, prepared to follow the walkers down the path with an infrared thermometer, sampling the temperature near each participant's feet five times per second. The walkers quietly gathered at the starting line.

Then, without warning, David Grout of Seattle implored the crowd to participate in the event by repeatedly chanting the word "puma" as loud as possible. As the audience shouted rhythmically, Grout sprang to the starting line, puffed several deep breaths, and launched himself at the long path. Moving quickly, he paced the entire length of the fire bed. The crowd cheered.

Willey walked next, and he, too, completed the sixty to seventy steps to the finish line. Kjetil Kjernsmo, a young physicist from Norway who studies firewalking, completed the distance after Willey. Soon, the "mind in matter" fellow, wired with a BBC microphone, began his trek down the lane. Talking to the camera, almost at a run, he covered the full distance. Then, to everyone's surprise, he immediately turned around on the grass, and returned to his starting point via another pass over the coals.

By 11:15 P.M. the fire bed had cooled quite a bit, but Willey made one last walk. While chatting with the BBC, he walked the complete length three times without stepping off of the coals. All of the firewalkers covered the full 165 feet, and no major injuries were reported. By the end of the evening, all of the participants seemed exhilarated but exhausted. The crowd dispersed, having learned, it was hoped, a simple lesson in physics. In that way, mind may have mattered, after all.

—David Noelle

David Noelle is a postdoctoral research associate at the Center for the Neural Basis of Cognition, a joint project of Carnegie Mellon University and the University of Pittsburgh.

Illinois Files Complaint Against Repressed Memory Doctors

The Illinois Department of Professional Regulation filed a twenty-three-page, nine-count complaint in August 1998 against Dr. Bennett Braun, a leader in the repressed memory movement.

Braun is one of the most well-known psychiatrists to believe in repressed memories, multiple personality disorder (MPD), and huge conspiracies of satanic cults. Indeed, he has taught other therapists how to obtain and deal with "repressed memories." The complaint has a direct bearing on how those beliefs affected his patients.

While Braun has been the target of at least five lawsuits (two settled, three in process, according to the False Memory Syndrome Foundation and *Chicago Daily Law Bulletin*), this is the first regulatory challenge to his claims. Mental health information is confidential, so charges could not be filed until a patient came forward to waive that confidentiality. The information leading to this complaint was provided by Patricia Burgus and her family after her lawsuit against Braun and others was settled out of court for $10.6 million in October.

Burgus started seeing Braun due to depression. Within weeks, she was caught up in the strange world of repressed memories, MPD, and satanic cult claims, including the belief that, according to the complaint, "she suddenly possessed 300 personalities and remembered sexually abusing her children, eating meatloaf made of human flesh, and serving as the high priestess of a satanic cult covering nine midwestern states." Even her children were caught up when Braun had them admitted to the hospital's psychiatric center at the ages of four and five.

The complaint details scores of charges against Braun. Among them are allegations that he confined Patricia Burgus to a mental institution for *twenty-seven months, and her sons for* three years, without any reasonable medical justification. Another charges that Braun's therapy caused Burgus and her sons to "believe that they had participated in episodes of abuse at the hands of [Burgus], other family members, and a supposed transgenerational, organized, satanic cult, including repeated episodes of sexual, physical, and emotional abuse, human sacrifice, and human torture."

The complaint also details the nine counts filed against Braun, including "Gross Negligence," "Dishonorable, Unethical, and Unprofessional Conduct," "Making a False or Misleading Statement Regarding the Skill or Efficacy or Value of the Medicine, Treatment, or Remedy Prescribed By Him at His Discretion in the Treatment of Any Disease or Other Condition of the Body or Mind," "Prescribing, Selling, Administering, Distributing, or Giving Any Drug Classified as a Controlled Substance or Narcotic for Other Than Medically Accepted Purposes," and "A Pattern of Practice or Other Behavior Which Demonstrates Incapacity or Incompe-

tence to Practice Under This Act."

Some of the charges in the "Gross Negligence—P.B." section (P.B. is Patricia Burgus), allegation 46, are:

- Established an unorthodox treatment regimen in assigning to P.B. various "personalities";
- Improperly implemented the aforesaid treatment regimen, encouraging and assisting P.B. in developing "personalities" which the Respondent represented were "alter" personalities within P.B., when no such personalities existed;
- Improperly implemented the aforesaid treatment regimen using suggestive and coercive techniques to encourage and assist P.B. to "remember" episodes of abuse;
- Advised P.B. and her husband that "repressed memories" being uncovered during the course of her treatment and her children's treatment represented real memories of actual historical events;
- Advised P.B. and her husband that organized, world-wide transgenerational satanic cults which engaged in mass murder, torture, satanic ritual abuse, human sacrifices and similar activities did in fact exist and that their existence and activities were well-known;
- Repeatedly advised and convinced P.B. and her husband, when either or both expressed doubt as to the existence of satanic ritual abuse or the validity of the memories of such abuse, that they were the only people questioning such concepts and beliefs;
- Advised P.B. that she had sexually abused her minor children;
- Advised P.B. and her husband that P.B. had caused their minor children to participate in various satanic ritual activities including human and animal sacrifice, cannibalism, and various acts of human torture;
- Failed to adequately inform P.B. and her husband of the risk that the techniques used in treatment were capable of causing false memories of events which never occurred by which nevertheless seem real to the patient;

Thomas Glasgow, the chief of medical prosecutions who developed the complaint, said, "The purpose of this complaint and the purpose of this prosecution is not to go after multiple-personality disorder or repressed memory." However, several counts of the complaint specifically say that Braun:

- Failed to adequately inform P.B. and her husband of the risk that the diagnosis of multiple personality disorder was controversial and that the diagnosis was not widely accepted in the mental health community;
- Failed to inform P.B. and her husband that there was further controversy in the mental health community as to whether or not multiple personality disorder was being overdiagnosed and often found in people who did not in fact have that disorder
- Failed to inform P.B. and her husband of the risk that "multiple personality disorder" can be caused by improper therapy;
- Failed to inform P.B. and her husband that the theory of repression lacked scientific validity and was not generally accepted in the scientific community.

Glasgow restated, in a telephone interview, that his office is not necessarily saying all repressed memory therapy is faulty, but in this case is alleging that Braun failed to take the proper steps to assure he was treating the patients properly.

The preliminary hearing before an administrative judge, originally scheduled for September 28 and then postponed, was only the first step in the process, which can eventually lead to punishment ranging up to revocation of his license to practice medicine in Illinois.

Braun's attorneys filed three motions seeking to have the case thrown out. The judge ruled against all three.

The department has also filed charges against Braun's colleague, Dr. Elva Poznanski. Poznanski was chief of child psychiatry at Rush-Presbyterian-St. Luke's Medical Center when the two Burgus children were institutionalized there. The nineteen-page, eight-count complaint against her contains charges similar to those filed against Braun.

More complaints may be filed against other doctors who used recovered memory therapy. Glasgow would not name anybody, but said there are ongoing investigations. He added that the complaint against Braun may be amended to include a large amount of new information he has received from other former patients after the news story broke.

—David Bloomberg

David Bloomberg is the chairman of the Rational Examination Association of Lincoln Land (REALL).

Tapes Said to Show Sybil's Multiple Personalities Bogus

A best-selling 1973 book by Flora Schreiber told the story of a young woman named Sybil who claimed to have sixteen distinct personalities. That book later became a film and did much to make the public aware of the affliction known until recently as multiple personality disorder (the new term is "dissociative identity disorder").

According to psychologist Robert Rieber of John Jay College in New York, long-lost audio tapes suggest that the personalities were in fact created by her psychiatrist during therapy through inadvertent suggestions. Dr. Cornelia Wilbur, Sybil's psychiatrist, died in 1992. The tapes, which lay in Rieber's desk since 1972, also show Schreiber improperly dismissing a letter from Sybil to Dr. Wilbur in which she denies having multiple personalities.

Rieber's conclusion is supported by Dr. Herbert Spiegel, a New York psychiatrist who treated Sybil when Dr. Wilbur was unavailable. Spiegel concludes that Sybil's personalities were iatrogenic, that is, they arose from therapy. Dr. Wilbur's therapy included giving names to Sybil's various emotional states. The problem occurred when Dr. Wilbur came to believe that the different names really were distinct personalities.

Tapes of conversations between Sybil's psychiatrist and Schreiber indicate that

they were "not totally unaware" that the story they told in the book was wrong. (For more on MPD, see August Piper, Jr.'s article "Multiple Personality Disorder: Witchcraft Survives in the Twentieth Century," May/June 1998 SI.)

—Benjamin Radford

Ben Radford is Managing Editor of SKEPTICAL INQUIRER.

Host of Paranormal Radio Show Creates a Mystery of His Own

In a turn of events that left just about everyone scratching their heads, the immensely popular late-night talk show host Art Bell unexpectedly announced in the early morning hours of his October 13 broadcast that he was quitting the radio business forever. Referring to his reason only as a "threatening, terrible event" that occurred to his family roughly a year ago, Bell went into seclusion and was unavailable for comment. And then, only ten days later, Bell told baffled listeners that he'd be back within a week.

So what happened? Despite the intense media interest virtually no one seemed to know.

Bell's "Coast To Coast" program, in which he invites listeners to join in wild discussions of the paranormal, is reported to have a nightly audience of some 15 million (though some report as little as 6 million) on more than 400 stations nationwide and is a consistent ratings winner. But even Premiere Radio Network, the syndication arm of the company that distributes his show, appeared to have been unaware of Bell's intentions. Spokeswoman Mir Hendrickson said that "Best Of" shows would be played for the remainder of the week, "until we find out what's going on." Subsequent press releases from Premiere announced that broadcaster Hilly Rose, himself a fan of the paranormal, would start the following week as guest host.

In the hours following Bell's sudden announcement, concerned officers from the local police department in Pahrump, Nevada, arrived at his desert trailer but found him in no danger. Early news accounts quoted Sheriff Lt. Bill Becht reporting that Bell was fine and that "any threats were not criminal in nature." But little else has been revealed since then about the "terrible event." Bell's private home telephone was disconnected and his e-mail account was not accepting new mail.

Not surprisingly, in Internet newsgroups and chatrooms speculation ranged from bizarre conspiracy theories involving alien abductions and government suppression to cynical charges that his "retirement" was merely a publicity stunt or was designed as a bargaining chip for salary negotiations. But a peculiar message posted on the Internet the day after his announcement seemed to provide the answers. Appearing to be from Art Bell, it explained that a time traveler who had accurately predicted various misfortunes was responsible for his leaving the air. Although the post was quickly labeled a hoax (the message's routing information did not match Bell's true address) at least two press reports cited the message as legitimate.

But perhaps the height of silliness came from Ed Dames, a frequent guest of Bell's show and president of a company called PSI-TECH, who said that remote viewing sessions, which allowed him to "go into Art Bell's mind directly," pointed to a "transcendent experience" that occurred to Bell in Egypt as the real

CSICOP Research Scholarship Set Up at Hertfordshire

The Committee for the Scientific Investigation of Claims of the Paranormal and The University of Hertfordshire have announced creation of the CSICOP Research Scholarship.

This three-year scholarship will fund a Ph.D. student to carry out research related to psychology and skepticism. Possible topics could, for example, include:

- The critical evaluation of evidence for the paranormal
- The psychology of deception, lying and fraud
- Eyewitness testimony and the paranormal
- The psychology of belief in the paranormal
- The media and the paranormal
- Communicating science to the public

This research will be conducted under the supervision of Richard Wiseman at the Psychology Department of the University of Hertfordshire (UK). Dr. Wiseman currently heads a research unit specializing in the scientific examination of alleged paranormal phenomena and related topics. The unit has a well established record of research and a postgraduate training program. The university, located just north of London, is well equipped to support research students and has an excellent record of Ph.D. completion.

Applicants should have a good first degree in psychology or relevant discipline, and be able to demonstrate an interest in skepticism.

Further details can be obtained from Dr. Richard Wiseman
University of Hertfordshire
College Lane, Hatfield, Herts., AL10 9AB
Direct tel: 01707 284628 • Direct fax: 01707 285073
E-mail: psyqrw@herts.ac.uk

cause for his departure. (Dames, by the way, offers a Technical Remote Viewing Home Training Course if anyone's interested.)

Hoping to clear up the rumors, Nye County Sheriff Wade Lieseke, who described himself as a personal friend of Bell, told a number of reporters that Bell's reasons were genuine and "highly personal." Answering a series of questions from Los Angeles radio talk-show host Jonathon Brandmeier, Lieseke said Bell's decision was not related to a government conspiracy, did not have to do with his or his family's health, and that he had not been threatened with any harm. These statements were echoed by Keith Rowland, the webmaster of Art Bell's Internet site, who added, "No one has recently threatened or intimidated him."

After Bell's initial announcement he made two additional pre-recorded statements. At the beginning of the "Coast To Coast" program on the following Monday, Bell again stated that he was not able to fully explain the situation. "To disclose details of what did occur, would have a rather immediate negative affect on my family. . . ." he said. Bell did reveal that some news organizations had "uncovered what went on" but that they had not yet proceeded with the story. (One news report stated that out of respect to the family the details were not being divulged.)

Then on Friday, a little over a week after Bell stated categorically, "I'm going off the air and will not return," Bell announced that he would indeed come back. In addition to thanking his network and his fans for their support Bell explained that "this was not any kind of hoax or stunt. . . . This was and is a family crisis, period," and that, "Should the matter become public despite my best efforts, I will have, believe me, a very great deal to say about it." Bell said that although "the difficulties . . . have not been resolved yet," the situation had improved enough to allow him to announce that starting on October 28 he would again host the "Coast To Coast" broadcasts. And based on messages posted to his Web site's discussion board one of which lamented, "This has been the worst ten days of my life" it appears that his fans couldn't be happier. Any updates to this story will appear in the following issue of the SKEPTICAL INQUIRER. As of this writing transcripts of Bell's announcements and links to press reports are available at www.artbell.com/artquits.html.

—Tom Genoni

Tom Genoni is the CSICOP West Coast Bureau Chief.

APS Position on EMF Affirmed: 'No Evidence of Health Effects'

The following item is taken from American Physical Society's "What's New" electronic newsletter of Oct. 2, 1998:

No wonder the public is confused about science. A panel convened by the National Institute of Environmental Health Sciences claims to have detected a pulse in the decaying corpse of the nineteen-year controversy over health effects of power line fields (WN 3 July 1998), voting to make EMF (electromagnetic fields) a "possible" carcinogen. Several panel members are involved in projects whose continuation depends on public concern about EMF. Their finding contradicts a three-year National Research Council review (WN 1 November 1996) and monumental National Cancer Institute epidemiological studies (WN 4 July 1997).

The APS had earlier concluded (WN 5 May 1995) that "conjectures relating cancer to power line fields have not been scientifically substantiated." On September 26, 1998, the E-board reaffirmed the APS position, adding that "in the period since, additional scientific studies and exhaustive epidemiological surveys have uncovered no evidence of health effects from power line fields."

—Robert L. Park

Physicist Robert Park writes the American Physical Society's "What's New" weekly electronic newsletter from Washington.

'Psychic' Sleuth Greta Alexander Dies

"Psychic detective" Greta Alexander died in mid-July 1998 at the age of sixty-six. The Associated Press referred to her "uncanny knack for helping police find missing people and bodies," and quoted a friend, a coroner, who claimed she once gave authorities "21 points" of accurate data about a missing girl.

Actually, that case gets better each time it is retold. Ward Lucas's investigation of the facts appeared in my book, *Psychic Sleuths* (Prometheus 1994). Lucas obtained a list of Alexander's "clues" in the case—twenty-four in all—and found that only one involved a specific name and that it was in error. Other predictions that might have been expected to help lead to the body "were so vague" Lucas concluded, "they could reasonably apply to virtually any portion" of the 20-mile stretch of highway the confessed killer had indicated.

Only *after* the police discovered the body—by searching a previously chosen location—did they find Alexander's clues accurate. Several statements that were in error were simply ignored, while others were reinterpreted as necessary. For example, there was no *church* nearby as predicted, so a *church camp* was counted as a hit. This technique of after-the-fact matching is called retrofitting.

One detective became further disillusioned with Alexander when he learned she had previously been briefed on the case by other investigators!

Uncritical media reports aside, there remains no proof that Greta Alexander or anyone else has ever located a body or solved a crime by psychic means.

—Joe Nickell

Joe Nickell is Senior Research Fellow for CSICOP. □

Fund for the Future

CSICOP AT THE CENTER FOR INQUIRY

1·9·9·8 PRIORITY

Using the Media & Telecommunications to Promote Science and Reason

The Fund for the Future is a capital campaign to provide CSICOP the resources needed to more effectively influence media and public opinion. The 90s have been defined by a telecommunications revolution, along with an explosion of misinformation available to the scholar and citizen alike. The hunger for superstition, pseudoscience, the paranormal and miraculous solutions has never been more acute.

The Ten-Year Plan

1998 Contributions are needed for current priorities:

- Increased media appearances by skeptical spokespersons
- Press releases, opinion pieces and media alerts
- Greater exposure through the Internet, including webcasting
- National initiatives coordinated by the Council for Media Integrity
- Instructional materials introducing skepticism to elementary and secondary school students
- Video production

Newsflash: This November CSICOP will convene a conference in Southern California to publicize many of these initiatives

Council for Media Integrity

Formed just weeks after its inclusion in the Ten-Year Plan, the Council for Media Integrity will monitor and rebut media programs that convey unfounded claims and mislead the public about science. Members include Steve Allen (chair), Stephen Jay Gould, *and many others*. CSICOP will invest in electronic infrastructure to facilitate rapid response to irresponsible programs.

Enhanced Library Resources

The Center for Inquiry's skeptics' library—already the finest of its kind in the world—needs expanded funding to enlarge its core collection and add electronic media. Worldwide modem access to the library's catalog is already nearly complete.

Adult Education

The Council cosponsors the Center for Inquiry Institute, which has already expanded its offerings to include a new three-year certificate program in science and skepticism. Sessions are scheduled in Amherst and Los Angeles.

How Can You Help?

CSICOP has established its expertise and integrity. It's time to command more media attention and a larger audience. The Center for Inquiry Fund for the Future is about new methods of outreach and broader influence, and is driven by an ambitious ten-year strategic plan for growth.

We depend on the support of readers and friends to continue leading the international skeptical movement. Gifts to the Fund for the Future provide the resources we need to respond to today's challenges.

All gifts are gratefully accepted. The Fund for the Future welcomes gifts of encouragement and major investments.

Cash contributions and gifts of stock are needed for immediate growth and new initiatives. We also offer a range of planned giving opportunities, from bequests to assorted tax-advantages trusts and pooled funds. Planned gifts support our work in the future and can provide an income stream for you and a beneficiary. You may also make a gift supporting the general endowment, or establish a special purpose fund underwriting a long-term project which expresses your personal interests and commitment to skepticism.

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Martin Gardner
Honorary Co-chair

Steve Allen
Honorary Co-chair

Regional Outreach

With the establishment of The Center for Inquiry–West (Los Angeles), The Center for Inquiry–Midwest (Kansas City) and The Center for Inquiry–Rockies (Boulder, Colorado), giant steps have been taken to enhance direct field service to skeptical activists. Additional regional Centers are planned with expanded calendars of activities.

Priority For the Young

To present the skeptical message more compellingly to the young, CSICOP will develop new materials—ranging from age-appropriate print publications to audio and video cassettes and instructional coursework. Goals include enhanced understanding of science and improved critical thinking skills.

The Internet: A World Brain?

World Brain, one of H.G. Wells's many long-forgotten books, was published in 1938. Although written before the computer revolution, in many ways it anticipated the Internet and World Wide Web. But first, some background on Wells as a prophet.

In both science fiction and nonfiction, Wells's predictions were a fascinating mix of hits and misses. He took seriously the belief in canals on Mars, and intelligent Martians are featured in his novel *The War of the Worlds,* and in several short stories. In *Anticipations* (1901) he thought it unlikely that airplanes "will ever come into play as a serious modification of transport and communication." In the same book's chapter on modern warfare he wrote: "I must confess that my imagination, in spite even of spurring, refuses to see any sort of submarine doing anything but suffocate its crew and founder at sea." In *The Way the World is Going* (1928) Wells anticipated the "complete disappearance of radio broadcasting."

In "The Queer Story of Brownlow's Newspaper," first published in *The Ladies' Home Journal,* April 1932, Wells described the contents of a 1972 newspaper. His hits include the use of color in newspapers, increasing space devoted to science news, a reduction in body clothing, and the collapse of Communism, although this did not happen until much later than Wells had expected.

The misses in Brownlow's newspaper far exceed its hits. Wells thought that by 1972 nations would have been rendered obsolete by the rise of a world government. Heat from Earth's interior would replace fossil fuels. English spelling would be simplified, the stock market would vanish, the gorilla would be extinct, newspapers would be printed on paper made from aluminum, and a thirteen-month calender would be adopted worldwide.

Wells failed to anticipate television even though Hugo Gernsback, who began reprinting Wells's science fiction in his *Amazing Stories,* was actually broadcasting television pictures in the twenties! One had to build a TV set to receive a postcard-size picture, but the technology was well underway.

Wells's last major effort to foresee the future was his imagined world history, *The Shape of Things to Come* (1932). Its misses were huge. Like Brownlow's newspaper, the book failed to foresee television, space flight, atomic energy, or computers.

Wells's wrong predictions were overshadowed by his single most astonishing hit. His novel *The World Set Free* (1914) opens with passages from the diary of a physicist who has split the atom and released atomic energy. The diary could have been written by Enrico Fermi. Wells's physicist agonizes over the horrendous results sure to follow from his achievement but he reasons that had he not made it, other scientists soon would have. The novel describes a world war started by Germany's invasion of France in the middle of the twentieth century. What Wells called "atomic bombs" are dropped from airplanes. The novel closes with visions of space explorations, beginning with trips to "that great silvery disk," the Moon, "that must needs be man's first conquest of outer space."

World Brain, written while the clouds of World War II were gathering, consists of lectures and a few magazine articles. Wells sees knowledge increasing at an accelerating pace. At the same time, most people around the world remain incredibly ignorant. As Wells had earlier remarked, humanity is in a race between education and catastrophe. What can be done to raise the educational level of the world?

Humanity desperately needs, Wells was convinced, what he calls a *Permanent World Encyclopaedia.* It would take the form of some forty enormous volumes that would be continually updated. At the time Wells wrote, specialized science journals were proliferating rapidly. Today there are some fifty thousand of them worldwide. What is needed so desperately, Wells maintained, is a central clearinghouse for this vast glut of information. The

Martin Gardner's latest book, Visitors From Oz, *was published in October by St. Martin's Press.*

great encyclopaedia would serve as a "world brain" by means of which information could be recorded and rapidly distributed around the world.

Wells likens the human race to intelligent persons with lesions in their brains—huge gaps between available information and public understanding. Horses have been replaced by cars, trains, and airplanes, Wells writes, but humanity is still in a horse-and-buggy stage. He emphasizes the rapid increase in travel and communication—what he calls the "abolition of distance." Yet in spite of such spectacular technical progress the world is like a ship in unchartered waters, sailing sluggishly toward a world community. For Wells, his mammoth encyclopedia would be a powerful force for unifying nations and speeding the coming of a war-free world.

Because English is now the world's most used language, Wells expected his Encyclopaedia to be in English. It would draw upon all the libraries of the world where information would be stored on microfilm:

> It seems possible that in the near future we shall have microscopic libraries of record in which a photograph of every important book and document in the world will be stowed away and made available for the inspection of the student. . . . Cheap standardized projectors offer no difficulties. The bearing of this upon the material form of a World Encyclopaedia is obvious. . . . The time is close at hand when any student, in any part of the world, will be able to sit with his projector in his own study at his or her convenience to examine *any* book, *any* document, in an exact replica.

We can forgive Wells for not anticipating computers. Change "projector" to "computer" in the above passage and Wells's vision is surprisingly accurate. Today a college student, even a high school student, is expected to own a computer. At a few touches of the keys, pages from millions of books and journals in libraries throughout the world can instantly flash on a monitor. Copies of art in museums can be downloaded in full color. With suitable equipment, music and voice recordings can be heard.

Research papers that once took years to come to the attention of scientists around the world are now starting to appear first as "e-prints" on the Internet, that vast network of networks that allows computers around the world to communicate with one another. Great efforts have been squandered in the past on research that duplicated work done years before but which was unknown to the rediscoverers. Today, such wasteful duplications are unlikely to occur because scientists can turn on search engines and quickly track down previously published reports.

"This Encyclopaedic organization," Wells wrote, "need not be concentrated in one place; it might have the form of a network. It would centralize mentally but perhaps not physically. . . . It is its files and its conference rooms which would be the core of its being, the essential Encyclopaedia. It would constitute the material beginning of a real World Brain."

"This Encyclopaedic organization," Wells wrote, "need not be concentrated in one place; it might have the form of a network."

From this continually updated fount of information, Wells wrote,

> would be drawn a series of textbooks and shorter reference encyclopaedias and encyclopaedic dictionaries for individual and casual use. That crudely is the gist of what I am submitting to you. A double-faced organization, a perpetual digest and conference on the one hand and a system of publication and distribution on the other. It would be a clearing house for universities and research institutions; it would play the role of a cerebral cortex to these essential ganglia. On the one hand this organization should be in direct touch with all the original thought and research in the world; on the other it should extend its informing tentacles to every intelligent individual in the community—the new world community.

Although Wells could not have known it at the time, he was writing about the Internet and the World Wide Web. How amazed and delighted he would have been by this revolution had he lived another half century!

Today the computer revolution is changing the world in ways as hard to predict now as it was hard to predict the consequences of the industrial revolution. Almost every conceivable topic now has one or more Web sites. Nearly anyone, of any age, race, sex, or intelligence can start a Web page. The 1998 edition of Luckman's massive *World Wide Web Yellow Pages* lists ten thousand Web sites, a mere fraction of the total number that grows larger every hour. Are you interested in learning more about any famous person? Chances are high that you will find Web pages devoted to that person. Popular science magazines, weekly news magazines, leading newspapers, and news television shows such as CNN and C-Span now have their Web sites. A dozen sites are devoted to cigars alone! Every major religion and bizarre little cult is online. Thousands of literary classics can be downloaded. Entire encyclopedias are available on a single CD-ROM. Entire runs of certain magazines such as *National Geographic* are on CD-ROMs. More and more libraries, including the Library of Congress, are putting their card catalogs online.

Consider my own hobby, conjuring. At last count there were almost two hundred Web sites devoted to such topics as magic history, card tricks, magic organizations, and magic periodicals. Almost fifty are sponsored by magic equipment dealers. More than a hundred are run by individual magicians!

Stores of all sorts are going online to sell goods, especially new and rare books, that you can purchase without leaving your home. You can buy groceries, a car, an airplane ticket, even browse through flea markets on the Web. Businesses are starting to decentralize into "virtual offices" where employees can work at home. Fiber optics will soon be replacing copper wires, allowing thousands of messages to be transmitted simultaneously over one fiber line. Cyberspace is only in

its infancy!

Were Wells alive today I think he would be writing about the Net's good and bad features. He would, of course, be enthusiastic about how the Net is speeding communication among scientists and scholars. He would welcome the way it is bringing diverse cultures closer together into a kind of global village of residents less inclined to slaughter one another.

On the other hand, I fancy that Wells would also deplore the darker corners of cyberspace. The incredible amount of valid information available to anyone online is not easily distinguished from the equally incredible smog of junk science, sleaze, and nonsense. At the moment, the Net is in a state of anarchy with almost no government controls. Do we need such controls? If so, how far should they go? At the moment, anyone can say anything on the Web. Cyberspace is infested with idiots, con artists, and purveyors of cybersmut. Advertising, especially the annoying ads that pop up in corners of the monitor, increasingly contaminate computer screens. As someone has said, it's like opening your mailbox and finding one letter, two bills, and sixty thousand pieces of junk mail. :-(

Stand-up comic Jackie Mason, in his recent one-man Broadway show, had these comments about netheads who boast of being able to converse with strangers:

> You want to talk to people all over the world? People don't talk to the guy next door. . . . A guy calls you up and he's got the wrong number. Do you start a conversation?. . . . Last week a guy tells me: "I spoke to a chap from Siberia, a mountain climber from Siberia.". . . . If a mountain climber from Siberia came over to your house and said, "Hello. I'm a mountain climber!" Would you say, "Come in, I'm dying to talk to you! All my life I wanted to talk to a mountain climber from Siberia!" :-)

Anyone online can turn on a search engine to contact a thousand Web sites devoted to pseudoscience, the paranormal, and the occult. Yahoo! lists multiple sites on biorhythm, alchemy, ghosts, astral projection, crop circles, dowsing, spontaneous human combustion, the hollow earth, witchcraft, voodoo, palmistry, sea monsters, and hundreds of other outrageous topics. Countless sites are devoted to UFOs and parapsychology as well. Astrology alone has some 150 sites!

Hundreds of sites deal with every variety of alternative medicine: iridology (diagnosing ills from spots on the iris), crystal healing, therapeutic touch, naturopathy, aromatherapy, urine therapy, homeopathy, orgone therapy, and on and on. Scientists may have learned how to use the Web wisely to keep up with global research, but the average browser is hard put to filter out the trash, not to mention the hardcore pornography that the government doesn't yet know how to curb.

Lost among the thousands of sites devoted to bogus science and the occult are a minuscule number of sites run by skeptics. Here are few main ones:

CSICOP/*Skeptical Inquirer:*
www.csicop.org

Australian Skeptics:
www.skeptics.com.au

James Randi Foundation:
www.randi.org

National Center for Science Education on evolution versus creationism:
www.natcenscied.org

Skeptic magazine:
www.skeptic.com

Quackwatch, Stephen Barrett's pages on health frauds:
www.quackwatch.com

Robert Carroll's Skeptic's Dictionary:
www.skepdic.com

News of interest to skeptics:
www.skepticnews.com

Prometheus Books:
www.prometheusbooks.com

Also on the Net's downside is the increasing number of computer owners suffering from a new addiction comparable to alcoholism and compulsive gambling. Millions of netomaniacs spend all their spare time surfing the Net, participating in chat rooms (there now are some twenty thousand of them!), checking news groups, playing computer games, and corresponding with persons whose character and even age they may not know. Elderly men and women find themselves in erotic dialogue with teen-agers. Youngsters may be induced to meet child molesters. Unsuspecting browsers may not be aware when they are victims of hoaxes and practical jokes.

What Wells liked to call humanity's current "age of confusion" is certainly reflected in the vast confusion of the Web. It will surely be many decades before the Internet settles down, if it ever does, into a healthy, admirable world brain, a force for good that Wells hoped would hasten the coming of a saner world. ☐

TWO EASY WAYS

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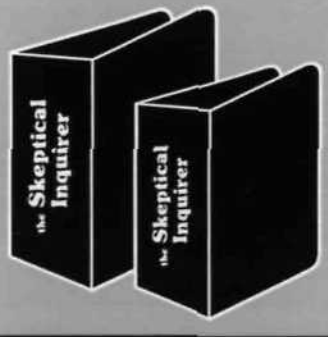

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INVESTIGATIVE FILES

JOE NICKELL

The Case of the Petrified Girl

Raised in the hills of eastern Kentucky, I grew up with the legend of the "petrified girl." Set in the little farming village of Ezel, near my hometown in Morgan County, the story evokes religious accounts of "incorruptible" corpses as well as ghoulish tales of the "undead."

Late in the last century—one account says "in 1880," another "the 1880s," still another "around 1900"—workmen were moving graves from the old Ezel burying ground to a new cemetery site. In some accounts the reason for the relocation is not recalled, but most state it was due to a typhoid epidemic that stemmed from the graveyard's pollution of local wells. In the course of the disinterments, the men uncovered the grave of a young girl. Some vague accounts have neither name nor age for her, while others reach near agreement that she was "a 17-year-old daughter of a Mr. and Mrs. Wheeler" or more specifically "Minnie Wheeler, a seventeen-year-old girl."

When her casket was reached it was reportedly too heavy to be lifted. But more men and ropes were obtained, and a hole was drilled in the coffin to let water out. Finally the still-heavy casket was lifted out of the grave and opened, whereupon the girl was discovered to have been petrified; even her clothing, says one narrative, had turned to stone (Nickell 1994).

Supposedly—some say because of fears the grave would be robbed and the body exhibited in a side show—the girl's body was reburied in an unmarked grave, the location of which was thereafter kept a secret. However, one versified account claims that the fears were actually realized: "To this day, her body had never been found, / Because her brother George sold her stone body for many crowns / to a museum for display; she brought in crowds. / People viewed her with awe in disbelief with frowns" (Plumlee 1993).

Documentation

Involving aspects of folklore analysis, historical and paranormal research, forensic pathology, and other disciplines, my investigation began with the collection of various narratives and personal interviews, then progressed to a search through the death notices in the *Hazel Green Herald.* There was no "Minnie Wheeler" listed, but there was this entry in the Wednesday, October 7, 1885, issue: "Miss Nannie Wheeler, daughter of J.W. Wheeler, of Grassy, died of flux [unnatural discharge] on last Thursday, and was buried at Ezel on Friday. Miss Wheeler was about 17 years of age." ("Last Thursday" would have meant that she died on October 1, 1885.) Federal census records revealed that "Nannie" was actually Nancy A. and that among her five siblings was a younger brother, George W. The matching surnames and the similarity of given names ("Nannie" easily being garbled into "Minnie"), together with other parallel details including the same age and a brother George, persuaded me I had found my quarry. The burial at Ezel was an especially corroborative fact, and so (I would soon learn) was the time period in question.

Further searching through back issues of the *Herald* turned up the following report, dated February 17, 1888: "The people of Ezel, feeling that the location of the grave yard [sic] has had much to do with the epidemic of sickness, on Wednesday commenced to remove those who are there buried to a more suitable place. We understand fifty graves will be required to accommodate the coffins removed." The following issue reported: "Ezel, Feb. 20 . . . A beautiful site has been procured for the public grave yard at this place, and the work of transferring the dead from the old to new grave yard has begun, and will continue until all are moved."

I expected next to see a report on the discovery of Nannie's "petrified" body, but, in one of the most disappointing moments in my career as an investigator, I learned there was a gap in the record—

Joe Nickell is Senior Research Fellow of the Committee for the Scientific Investigation of Claims of the Paranormal and author of numerous books including Looking For a Miracle.

A relocated cemetary in Ezel, Kentucky, supposedly holds among its secrets a "petrified girl," believed buried among these graves. (Photo by Joe Nickell)

missing issues of the newspaper during the relevant period. I was therefore forced to rely on hand-me-down narratives. Although, as I have already indicated, these are quite variable as to details, the *effect* of the discovery comes through quite clearly. But was Nannie's body really *petrified?*

Petrifaction?

On the one hand, the water that was reportedly drained from the coffin could be an indication that conditions were right for petrifaction. That occurs when ground water containing dissolved mineral salts infiltrates buried organic material, replacing the decaying matter with the minerals while preserving the shape and even the cellular structure of the original material ("Petrifaction" 1986).

On the other hand, true petrifaction in the case of a coffin burial would be exceedingly unlikely. Several "petrified" people have been outright hoaxes, including the Forest City Man, shown at the World's Columbian Exposition in Chicago in 1893; the Pine River Man (made of water-lime, sand, and gravel) "discovered" in 1876; the Colorado Man (faked for P. T. Barnum at a cost of $2,000); and others, including the notorious Cardiff Giant (unearthed at Cardiff, New York in 1869) (MacDougall 1958, 23–24; Stein 1993, 13–14, 145).

Often, bodies are said to be petrified when observers are simply astonished to find them in a surprising state of preservation. For example, there is a persistent legend that the corpse of Abraham Lincoln was "petrified" and indeed had "turned to stone" when it was observed in a well-preserved state while his body was on tour after his assassination in 1865, as well as upon reburials in 1886 and 1901. On the latter occasion, his corpse was described as resembling "a statue of himself lying there." In fact, the body had been expertly embalmed and had been kept in an airtight coffin (Lewis 1929).

I researched another Morgan County case that occurred in 1921 when the body of a woman who had died elsewhere was brought home by train. When people touched her well-preserved body, it felt "hard," and several thought it was "petrified," although the railway company physician explained the body was simply embalmed—something the rural folk were relatively unfamiliar with (Nickell 1994).

In the case of young Nancy Wheeler, the excessive weight of her coffin could well have been due to its having been waterlogged (as in fact described), and/or due to the story's exaggeration over time. But what about the unusual preservation itself? It is extremely unlikely that her body was embalmed, yet after nearly thirty months it had remained free, or apparently free, of decomposition.

Although comparatively rare, there are numerous reports of "incorruptible" corpses. In more than one instance investigation has shown that the body had, in fact, been embalmed. In many other cases the body is actually mummified—i.e., desiccated—a condition that can occur naturally under certain conditions (such as being kept in sandy soil or in a dry tomb or catacombs). (It can also be induced by embalming.) Several supposedly "incorruptible" bodies of Catholic saints are revealingly described as "having brown, dry skin with the texture of leather," or being "darkened and wrinkled with age," even "completely mummified" (Cruz 1977). Some of the corpses on display in glass coffins have had to be extensively repaired—for example being treated with resin and braced with wire, and even, like St. Bernadette of Lourdes, having the exposed face covered with a wax mask (Cruz 1977; Nickell 1993, 85–93).

But what about cases in which the corpse had not been kept in dry conditions but rather was found intact despite perpetually wet conditions? As forensic pathologists and anthropologists know, a body that has been submerged in water or in wet soil for a long time may form a soaplike substance called *adipocere,* which may develop in the outer layer of fat after three months or more (Spitz 1993, 38). It is estimated to become "complete in adult bodies" after "a year to a year and a half" (Gonzales et al. 1954, 68). Adipocere was once thought to be caused by the body's fat turning literally into soap; actually it is due to the decomposition of the fat into insoluble salts of fatty acids, producing a yellowish-white substance popularly known as "grave wax." It usually forms in the face and buttocks, but may affect any part of the body. Depending on the subsequent conditions, the body may eventually take on the leathery effect of mummification, or may in time decompose completely (Ubelaker and Scammell 1992; Geberth 1993). (Many of the "incorruptible" bodies of saints are only temporarily preserved and are later found to be reduced to skeletons

[Nickell 1993]).

In certain European (e.g., Slavic) and other countries the discovery of a preserved corpse may provoke a bizarre response. Some people believe such preservation means the person is one of the "undead," so they may drive a wooden stake through the corpse's heart and then burn the body to end the imagined ghoulish activities of the "vampire" (Wilson and Wilson 1992).

Most likely, adipocere produced the "petrified" appearance of Nannie Wheeler's corpse which was reportedly unearthed in conditions of excessive saturation from ground water. Certainly her body does appear to have been well preserved—some say as beautiful as she had been in life, with her hands still clutching her hat. However the time between burial and disinterment had been less than two and a half years, and there have been instances of excellent preservation over much longer periods—even without apparent embalming.

An 1896 Massachusetts case may likewise be explained by adipocere formation. Reportedly, a woman's body, being relocated to another cemetery, was found to be "petrified." If it is true that (after several months) "the flowers on her breast *seemed as fresh* as on the day of her burial" (emphasis added), that is more consistent with their having been kept under cool, wet conditions than with a claim of petrifaction, since flowers that were actually petrified would have looked like stone. Significantly, there was "a spring which boiled up nearby" (Whalen 1981).

As to the story about Nannie's body being placed on display, that is probably untrue, being absent from all but one account. It was apparently based on someone having seen a body in a museum (reportedly in Cincinnati) that was thought to resemble the teenager.

It is an irony that the young lady has come to be better known for her repose in death than for her all-too-brief life, but such is the effect that mystery can have.

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Apocalypse Soon

Some say the world will end by ice, others say by fire, and still others say by computer glitches. While there has long been the general expectation that something absolutely dreadful would happen in the year 2000—the Reverend Louis Farrakhan still foresees a plague of earthquakes, hailstorms and floods—until recently doomsayers couldn't agree on just what was going to do us in. But suddenly most doomsayers now agree that the Year 2000 Problem for computers is the menace that will bring about the end of civilization. Sometimes called the "Y2K" or "millennium" bug, it is the result of the short-sighted programming technique of employing only two digits to represent a year, presupposing that the first two digits would always be "19." No one denies that the Y2K problem is very serious, and the computer industry is now spending a lot of money to repair it.

However, according to some it's already too late, and it's time to head for the hills. The Sept. 15, 1998, issue of the *Weekly World News* proclaims January 1, 2000, as "The Day The Earth Will Stand Still." "All banks will fail! Food supplies will be depleted! Electricity will be cut off! The stock market will crash! Vehicles using computer chips will stop dead! Telephones will cease to function! Domino effect will cause a worldwide depression!" Given that this publication has, over the years, rarely allowed any snippets of nonfiction to intrude upon its wonderfully made-up stories, one might at first assume that their Y2K crash-and-burn scenario is as bogus as their story about soap made with holy water that revives the dead. But a lot of people are taking such cries of an impending Cyber-Armageddon very seriously indeed.

Longtime fire-and-brimstone author Gary North has devoted his entire Web site to the year 2000, which he calls "the year the earth stands still" (see www.garynorth.com). This is the same author who, in *None Dare Call it Witchcraft,* warned us that UFO and paranormal manifestations are indeed real, but demonic in origin. North is a leading spokesman for an extremist fundamentalist sect, who has written of his hope that our present society will collapse so that it can be reconstructed according to strict Biblical guidelines. The Y2K problem, he warns, "may be the biggest problem that the modern world has ever faced. I think it is. At 12 midnight on January 1, 2000 (a Saturday morning), most of the world's mainframe computers will either shut down or begin spewing out bad data . . . Think of what happens if the following areas go down and stay down for months or even years: banks, railroads, public utilities, telephone lines, military communications, and financial markets. What about Social Security and Medicare?" The result, says North, will be nothing less than catastrophic: "I think the division of labor will collapse in 2000. If the power grid goes completely down, it will stay down. The division of labor will collapse to early nineteenth century levels, except that we have lost early nineteenth century skills."

If this scares you so much that you want to head for the hills, entrepreneurs are getting the hills are ready for you. A development called Heritage Farms warns of "The Millennium. The Y2K Computer Meltdown. Economic Recession/Depression. Doomsayers predict nothing short of total collapse within the next two years. Will any of it happen? We don't know, and we seriously hope not, but the mounting evidence was convincing enough to make us look for a place to ride out the turmoil. We have now found it in Arizona!" Located 180 miles northeast of Phoenix, Arizona Heritage Farms promises that its "capability of total self-sufficiency, and independence from outside energy sources" makes it "the model rural village for what may be a whole new way of life in the first part of the next century" (see http://www.heritagefarms2000.com). "500 families of the New Millennium can grow their own food and food for their neighbors to purchase or barter. They will harvest electrical energy from

Robert Sheaffer's World Wide Web page for UFOs and other skeptical subjects is at http:www.debunker.com.

the sun and wind." Their original plan for a Y2K refuge in Sully County, South Dakota, was unanimously voted down by local zoning officials, who feared that a doomsday cult might be forming in their midst. Kevin Poulsen of Ziff-Davis TV says, "As planned, the Y2K village would be one half refuge from millennial madness, and one half Disneyland. Main Street would be clean and neat with an Old West theme." A splendid place, no doubt, to stand by and watch the spectacle of the collapse of civilization.

If you're not quite ready to head for the hills but want to stockpile food for anticipated Y2K chaos, check out www.y2kfood4u.com, one of many "survivalist" Y2K sites. They offer bulk rations of long-storage freeze-dried food to help ensure your survival for however many months or years it may take for your grocery store to get their cash registers back online in the new millennium. There is even a "Year 2000 Problem Site Exclusively Designed for Women" (http://www.y2kwomen.com), explaining "The Year 2000 Computer Problem: The 10 Things Every Woman Must Do Now to Keep Herself and Her Family Safe." Presenting gloom-and-doom survivalism with a gentle feminine touch, it contains advice on how to handle all of the expected privations of the impending millennium, even including an expected interruption in the supply of disposable products for feminine hygiene.

The spiritual leader of the doomsayers is a man whose judgment was, until recently, seldom questioned: Ed Yourdon. A thirty-five-year veteran of the computer industry, Yourdon attained prominence in computer science as the lead developer of the structured analysis/design methods of the 1970s, as well as a co-developer of contemporary methods of object-oriented analysis (see www.yourdon.com). But now Yourdon has written *Time Bomb 2000*, which has become a bible to the sky-is-falling crowd. Yourdon writes that, "My wife and I recently sold our New York City apartment and bought a house in a small town in New Mexico; but I'm not abandoning the computer field, and I would have been moving out of New York City even if Y2K hadn't come along" He suggests, however, that Y2K was a major factor in that decision: "I've often joked that I expect New York to resemble Beirut if even a subset of the Y2K infrastructure problems actually materialize—but it's really not a joke. It's likely to be fairly cold on New Year's weekend, and a combination of disruptions in utilities, telecommunications, banking, schools, hospitals, airports, unemployment checks, Social Security checks, food stamps, and/or welfare checks would be enough to make the citizens of New York extraordinarily grumpy. There's enough gunfire in the streets even in normal times, and I'm not comfortable exposing my family to the city's ill humor if Y2K turns out to be a serious problem." Yourdon positively agonizes over the social responsibilities of programmers who, convinced that a Y2K disaster is unavoidable, head for the hills: "[N]ot every Y2K programmer can realistically contemplate leaving town for a safe haven. Some have aging parents or other family members who categorically refuse to leave the urban environment in which they reside; and some have a combination of financial, emotional, physical, or other miscellaneous reasons that require them to stay where they are . . . the safe-haven debate ultimately comes down to a simple and basic question: what responsibility do Y2K programmers have to stay on the job after December 31, 1999? If we assume that every programmer works eighteen hours a day, seven days a week, at whatever Y2K job he/she should be expected to carry out between now and December 31, 1999, then do we have a right to expect continued loyalty beyond that point?"

As if starvation and riots were not serious enough problems, some proclaim that the Millennium Bug threatens the ultimate disaster: nuclear war. According to an article by conspiracy theorist Daniel Perez (see http://www.terminator3armageddon.com/conspira/nukey2k.html), "[T]he Russian 'doomsday system' is designed to be switched over to automatic mode by military commanders and only launch Russia's missiles if it senses that the city of Moscow has been destroyed. The system works with no human intervention and sends coded messages to the missile silos." This automatic launching system is only supposed to be switched on if an attack is believed to be imminent, but Perez, like all Y2K catastrophists, assumes that the worst-case scenario is always the inevitable one: "Since the Year 2000 begins at the International Date line in the Pacific and moves westward across Siberia and Russia, the first part of the Russian nuclear arsenal that would be affected will be the missile silos in Siberia and eastern Russia." Supposedly, computers at missile sites in Siberia, believing that Moscow has been destroyed because they cannot communicate with areas where the date is still 1999, will switch over to the automatic system and begin firing nuclear missiles at the U.S. But wait, there's more: "On August 22nd, 1999, the GPS [Global Positioning Satellite] system is scheduled to break down," according to Perez, a statement that the U.S. Defense Department would strongly dispute. "If that system isn't up on December 31st 1999, the United States would be utterly defenseless and unable to launch a retaliatory strike."

In recent months, Y2K survivalist advertising became a mainstay on Art Bell's late-night, high-weirdness nationwide radio show, paying many of the bills for the nonstop conspiracy-and-UFO chatter. Indeed, many Y2K doomsday Web sites link in to "www.artbell.com." Then suddenly on the morning of October 13 at 02:55, just before signing off, Bell announced without warning, "You may recall about a year ago . . . I told you that there was an event, a threatening terrible event occurred to my family, which I could not tell you about." (Despite the existence of a virtually complete on-line archive of sound files from Bell's shows, no one has yet found this supposed warning.) "Because of that event, and a succession of other events, what you're listening to right now is my final broadcast on the air. This is it folks, I'm going off the air and will not return." This announcement, of

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Fears of the Apocalypse
The Escape from Reason

Millennium hysteria has been with humankind for a long time, but when it is combined with doomsday prophecies, the result can be a dangerous flight from reason. The following was adapted from the opening address at the Second World Skeptics Congress held in Heidelberg, Germany.

PAUL KURTZ

Is the world about to end? Are we living in the last days of civilization? Will the human species and the planet Earth be engulfed in fire storms, earthquakes, floods, or be destroyed by the impact of an asteroid? As we approach the year 2000 we are surrounded by prophets of doom who predict that terrible disasters await us. Obviously the year 2000 has special significance in these scenarios, for it marks the beginning of a new millennium. The year 2000 and the years soon thereafter seem to be the deadline for many end-time prophets. But we may ask: Does the new millennium start January 1, 2000 or 2001? The calendar we use begins at year 1 instead of 0 — for a zero was left out in the transition from B.C. to A.D. Thus, a century does not begin with a double-zero

year, but ends with it. If this is the case, the new century and millennium begin with an *01-year*, not an 00-year.

But it is not clear that 2001 is the beginning of the new millennium, because the Western world measures it by the birth of Jesus Christ. But many Biblical scholars agree that we know very little if anything about him, though many believe that he was actually born four to six years *before* the year A.D. If this is the case, the third millennium might already may have begun in 1996, not in 2000!

The millennium is actually a human creation of our culture, an arbitrary date in eternity. Why it should be of special significance is muddled, aside from its religious meaning or cultural bias.

Most non-Christian cultures in the world do not measure the calendar by the date of Christ's birth. The Chinese year in 1998 is 4696, the Hebrew calendar 5760. For the Muslims, the calendar begins in 622 A.D., when Muhammad went from Mecca to Medina, and 1998 is actually the year 1420. It is 6236 according to the ancient Egyptian calendar, 2749 for the Babylonian, 2544 for the Buddhist, 5119 for the Mayan great cycle, and 2753 according to the old Roman calendar.

The Gregorian calendar was first initiated by Pope Gregory XIII in 1582, replacing the Roman Julian calendar of Julius Caesar, which was ten days different from today's. After the decline of Rome, Britain celebrated New Year's Eve on December 25th—until William the Conqueror changed New Year's to January 1, 1066, the date of his coronation. Britain subsequently changed it to March 25th, and later to accord with other countries. The French desired Easter Sunday to be New Year's Day. For the Chinese, New Year's Day is at the end of February.[1]

Thus, January 1, 2000 or 2001 is really a meaningless non-event—an expression of Western socio-cultural prejudice, of no special significance in the nature of things.

Secular Doomsday Prophecies

Nonetheless, there is a perennial concern for the future. Human beings always wish to peer ahead and know what will ensue tomorrow or next year or in the next century. Many of these interests are based on expectations of a better and more promising world. But there are often predictions of gloom, and great apprehension.

Three kinds of forecasts may be distinguished among the Doomsday prophecies. First, *secular predictions*. We recently enjoyed a period of great economic optimism, as stock markets, at least in Europe and America, soared. The bulls dashed forward with rosy forecasts. There was sustained technological scientific expansion. Some people even predicted a long boom in which the economic cycle had been overcome. This was based on new industries: telecommunications and the information revolution, biogenetic research, and space technologies. Under this scenario the bulls predicted that Germany and France would overcome their recession, unemployment would be solved, the Asian and Russian economic slump would become a thing of the past, and gross domestic products would continue to expand as prosperity gains. This scenario was one of unlimited horizons. By contrast, the bears focus on the negative: The year-2000 computer bug will wreak havoc everywhere, they warn, oil shortages will appear, either deflation will overcome us or inflation will re-ignite, and the Dow-Jones stock exchange average will plummet from 9,300 to 3,000 in a short period of time. Here the pessimists prevail. Following the scenario of the Dutch Tulip bubble bust, crowd psychology rules the day, as the public is engulfed first by the fervor of speculative binge and then by pessimistic forecasts of doom. One may ask: whose prophecy of the future will prevail—the optimists, pessimists, or neither?

Another key source of present doomsday scenarios is science fiction, in which the future is unusually bleak: either Big Brother will emerge, or complete anarchy will prevail. Science projects doomsday asteroids or comets striking the earth. *Deep Impact* and *Armageddon*, two Hollywood movies, arouse fear and terror, and *Jurassic Park* brings back the dinosaurs to devour us.

Probably the most frightening secular prognostications are environmental scenarios of runaway population growth and devastating ecological pollution.

Many of these forecasts are not end-of-the-world predictions, but they illustrate the difficulties of making long-range extrapolations. Of course there are real dangers—from environmental damage to nuclear war—and we need to be aware of them and to take rational precautions; for example, global warming and the depletion of the ozone layer. I am surely not denying that there are genuine problems that need to be seriously addressed. But not too long ago we were warned that the world would be overtaken by famine, that hundreds of millions—even billions—of people would starve to death, and that the cities and countrysides would be teeming with swollen bellies. Contrary to expectations, India and other impoverished countries have managed to increase their food production, and while there are famines in Africa, the predicted worldwide famine has not occurred.

Demographers told us only a decade ago that population growth would increase exponentially and that there was no way to stop it. By the year 2000, they said, there would be seven billion inhabitants on the earth, and by 2020, 15 billion or more. But, in many parts of the world, there has been a significant decrease in the rate of population growth; and the extreme projections for 2020 are most likely exaggerated.

Some ecologists maintained only twenty years ago that by 1980 the atmosphere would be so polluted that we would

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need to wear gas masks year-round—not even in Los Angeles has this occurred! They warned that many of our lakes and waterways would be so despoiled that all of their fish and plant life would be destroyed. The Great Lakes, they said, would be totally dead. President Lyndon Johnson in 1968 visited the Buffalo River in western New York and ignited it with a match. Massive efforts to clean it up followed. There has been a noticeable increase in the fish harvest in Lake Erie, and the lake seems to be coming back. Ecologists have warned that we would deplete our natural resources and run out of oil, gas, and other fossil fuels in the near future. In the long run they are probably correct, but new resources have been discovered and new sources of energy developed.

A frenzied phobia of the unknown surrounds the additives and chemical wastes of modern technological society. There is fear of cancer-causing agents; everything from fluoride to sugar has been claimed to be noxious.

We have been told by successive Cassandras that the imminent collapse of major banks would bring down the entire world financial system, that galloping inflation was uncontrollable, and that we were on the verge of a depression that would change the face of society. No doubt we will continue to experience recessions, possibly even depressions, in the future. Marx predicted armageddon for the capitalist system. Millions of pessimists are still waiting for that to occur. They think every recession will lead to a worldwide economic collapse. Interestingly, George Orwell's 1984 has arrived and passed and our freedoms are still intact, much to everyone's surprise.

Overhanging all of this is the sword of Damocles—nuclear energy. Nuclear fears engulfed large sectors of society. Anything related to radiation was considered diabolical. In many countries the public shrinks in terror at the thought of the opening of new nuclear power plants. The greatest fear of all is the fear of a thermonuclear holocaust. We are admonished on all sides that death stares us in the face and that some miscalculation would inevitably trigger a worldwide nuclear war. The results, we were told, will be a nuclear winter and the near extinction of all life on this planet. This was the Age of Anxiety par excellence.

Pessimists become angry at realists who think that civilization and the human species are likely to muddle through periodic crises and mini-crises but still survive these end-of-

Brad Marshall

the-world forecasts. I am only advising that we place them in a balanced perspective. But to say this infuriates those who are convinced that our whole universe will collapse. In one film Woody Allen worried about what modern astronomers have to say about the cosmos, that there are two ultimate possibilities: either the universe will expand into infinity, cool down, and die, or eventually collapse into itself like an accordion.

For many the Apocalypse seems to be almost a wish fulfillment. The mundane world lacks the drama that a fertile apocalyptic imagination produces.

Religious Doomsday Prophecies

A second area for Doomsday scenarios are *religiously based.* Indeed, we today find hundreds of millions of people who interpret the world primarily through a biblical lens and see their own end-of-the-word scenarios. Much of this is based on the Book of Daniel of the Old Testament and the Book of Revelation of the New Testament. But their vision is far more terrifying than anything that mere secularists can dream up, because it is all part of God's plan of punishment for sinners. And it is imminent. Moreover, only a small portion of suffering humanity will be saved from it. Several Protestant sects, such as the Jehovah's Witnesses, have held apocalyptic theologies in the past.

Today the message that fundamentalist prophets are preaching is one of a millennial Armageddon. They are truly convinced that we are living in "the last days," and they view earthquake tremors, wars, and rumors of war as signs of the impending apocalyptic disaster. The last great battle of Armageddon is approaching, we are warned. Indeed, *this* generation, many of them insist, is the *last* generation, and this was all foretold in the Old and New Testaments. Jesus said: "I tell you this: the present generation will live to see it all" (Matt. 24:34–35, New English Bible). And "Verily I say unto you, This generation shall not pass, till all these things be fulfilled" (Matt. 24:34, King James Version). Many of Jesus' disciples believed that his admonitions applied to his own generation in the first century A.D. That prophecy did not come true for the early Christians, and almost 2000 years have since passed. We were told by Pat Robertson, Hal Lindsey, David Koresh, Harold Camping, Edgar C. Whisenant, and other evangelists that the generation referred to is *ours.* Even President Ronald Reagan was quoted as saying in the 1980s: "You know, I turn back to your ancient prophets in the Old Testament and the signs foretelling Armageddon, and I find myself considering if we're the generation that is going to see that come about. I don't know if you noted any of those prophecies lately but, believe me, they certainly describe the times we're going through."

In his book, *The Late Great Planet Earth* (a bestseller in the U.S. in past decades), Hal Lindsey claimed that Armageddon is just around the corner. According to biblical prophecies, seven years of terrible tribulation will soon befall mankind. This period is about to begin because the Jewish people after the long Diaspora have finally returned to their ancient homeland in Palestine, which they left after the destruction of the Temple of Jerusalem in A.D. 70. And it is a genuine reality, we are told, because of the establishment of the State of Israel.

Next, Lindsey says, the Israelis will rebuild the temple in Jerusalem. Then a whole series of cataclysmic events will trigger the final Armageddon. A great war will ensue. Israel will be invaded from all sides: by a confederacy from the North (which was said to be the Russians), by the Arab nations, and by a great power from the East (which was identified as the Chinese). During the period leading up to these events, there will also emerge a European confederation—the old Roman Empire, now the European Common Market—headed by an Antichrist preaching a new religion. These years will witness the greatest devastation that mankind has ever seen. The valleys will flow with blood, cities will be destroyed by torrents of fire and brimstone—this, it is said, represents a thermonuclear war, World War III, the most awesome holocaust of all time. At that moment, Jesus Christ will return to rescue in rapture those true believers who accept the word. Christ will reign for a thousand years and eventually establish his final kingdom throughout all eternity.

In a series of four new books that have suddenly swept to the top of the bestseller list, millions of people disappear from the face of the earth. The have been snatched from homes and offices, automobiles and airplanes—all saved by the rapture, which has taken God-fearing Christians to heaven, while the rest of humanity is left behind to suffer the terrible trials and tribulations inflicted by the Antichrist. This is the plot of the fictionalized apocalyptic series, *Left Behind,* by fundamentalist preacher Tim LaHaye and Jerry B. Jenkins.[2] LaHaye ominously forewarns on his Web site that the year 2000 computer problem could trigger a "financial meltdown" as prelude to the world's destruction.

Fears of the "last days," it has been claimed, appeared at the end of the first millennium. Charles Mackay, in his 1841 work, *Extraordinary Popular Delusions and the Madness of Crowds,* depicted the epidemic terror that seized Christendom in the middle of the tenth century, as people expected the last judgment.[3] Some said that Mackay's account was pure hyperbole. In any case, the first millennium passed without the destruction of the world! Why should it occur in the second?

Many people in history have believed in the end-of-the-world scenario based on the Bible, and they often thought that it applied to their own age. A graphic illustration is the case of William Miller and his followers in the nineteenth century. Miller, a fundamentalist Protestant preacher from Vermont (and precursor of the Seventh-Day Adventists) studied the Bible carefully. He was convinced that the world would come to an end in his own day, sometime between March 21, 1843, and March 21, 1844. He based his analysis upon a specific

biblical passage that draws on the Book of Daniel. "And he said unto me, Unto two thousand and three hundred days; then shall the sanctuary be cleansed" (Dan. 8:14, King James Version). Miller interpreted "days" as "years." Since the prophecy was dated 457 B.C., the end of the world, he said, would occur two thousand and three hundred years later, in 1843. The Millerite groups—which numbered in the thousands—sold their possessions and awaited the final day. But, as we know, nothing happened. When 1843 passed he extended his prediction by another year, but again nothing happened. This forecasting of the end of times has been repeated many times throughout history. The same thing is most likely true, in my judgment, of present-day predictions of Armageddon.

Other religious traditions have prophetic-apocalyptic themes: Buddhism awaits Lord Matrieya, Islam the Madhi; Orthodox Judaism the Messiah; and Native American Indians wish to return to nature as it was before the European invasion. For those who use the Mayan calendar, the world will end in 2012.

It is clear that a state of belief may help create a self-fulfilling or suicidal prophecy. A widely held belief can have profound political and social ramifications, especially if it is held by people in positions of power. Apocalyptic thinking may mean that those who are under its sway will do little or nothing to prevent overwhelming disaster, fatalistically awaiting what is inevitable; or they may so act as to allow it to come true, believing that they are fulfilling divine prophecy. The problem with faith in prophecy is that it can take control of the future out of the hands of those best able to shape it. We are supposedly impotent and helpless creatures awaiting our fate, unable or unwilling to exert any influence to rectify or modify the course of events. The fixation on apocalypse grows out of fear of the unknown, and it is fed by hope for redemption. Often when the prophecy is falsified, the convictions of the believing group are intensified and the prophecies extrapolated.[4]

In democratic societies we need an informed public capable of wise decisions and without fantasy. We know of the dangers that distorted, apocalyptic, survivalist, conspiratorial, or pseudoscientific ideologies have had on societies.

New Age Doomsday Prophecies

A third kind of doomsday prophecy is that offered by *New Age cults*. The Committee for the Scientific Investigation of Claims of the Paranormal and the world skeptics movement have examined a great number of the paranormal claims that are proliferating today from psychics, fortune tellers, seers, and gurus of various kinds. These include the failed predictions of Edgar Cayce, "the Sleeping Prophet," who warned of a massive shifting of the poles in the years 2000–2001. They involve a number of suicide cults, such as the UFO-related "Heaven's Gate" and the French-Swiss-Canadian space-age religion, "The Order of the Solar Temple." They also include the bizarre annihilation agenda of Japan's "Aum Shinrikyo" cult, and the many New Age cults proliferating in Russia today. There are also numerous astrological predictions of disaster due to planetary alignments, such as the so-called "Jupiter Effect." And psychics are now having a field day in their Armageddon prophecies. How many times are those who claim to have precognitive or psychic powers correct in their prophecies? The track record, I submit, is extremely weak. We can and do make predictions about the future based on evidence and rational inference, and often these predictions are reliable. But those made on the basis of mystic power, psychic intuition, or astrological forecasts prove to be no more accurate than anyone's wild guesses. Those who make such claims often fit a prophecy or vision to present circumstances *after* the fact, or they make the prophecy so general that it can be related to virtually any case. This has been done with the predictions of the ever-popular Nostradamus, the sixteenth-century seer. His quatrains have been read by every generation, including the present one, and his prophecies have been adapted to all sorts of circumstances in every time period. Often what is taken as prophetic is only due to coincidence; events are not preordained and predetermined as the prophetic tradition maintains. The future depends upon our own actions in the given situations. There are no special secret paths to knowledge of the future.

In conclusion, we live in a highly developed scientific and technological society. We face awesome problems. If we are to solve them, we must draw upon the best critical intelligence available. We need to use our rational powers, not abandon them. In free societies anyone is entitled to his convictions. Yet democracy presupposes an educated citizenry. When apocalyptic faith is intermingled with ideology, it can have deleterious social, political, and military consequences. It is at this point that all those committed to skeptical inquiry have an obligation to carefully examine those claims being made about our collective future, whether they are based upon so-called revealed prophecies or not, and to submit them to empirical criticism. There is thus a compelling need for critical examination of the prophecies of doom—whether secular, religious, or New Age—for these have serious implications for the world at large. And that is one of the key tasks of this World Skeptics Congress.

Notes

1. For fuller discussion of this, see Richard Abanes, *End-Time Visions: The Road to Armageddon?* (New York and London: Four Worlds Eight Windows, 1998).

2. The four books, all by Tim LaHaye and Jerry B. Jenkins, are *Left Behind* (1995), *Tribulation Force* (1996), *Nicolae* (1997), and *Soul Harvest* (1998), all published by Tyndale House Publishers.

3. Charles Mackay, *Extraordinary Popular Delusions and the Madness of Crowds* (New York: Crown, 1980).

4. See Leon Festinger, Henry W. Riecken, and Stanley Schachter, *When Prophecy Fails: A Social and Psychological Study of Modern Groups That Predict the Destruction of the World* (New York: Harper and Row, 1956). □

The Bible and the Prophets of Doom

Millennialism, which suggests that supernatural powers will soon establish a perfect world, reflects a failure of nerve and the abandoning of hope in human potential to resolve social and ecological problems. Despite the claims of divine revelations, it is possible to trace the social historical evolution of the beliefs that lie behind end-of-the-age theology.

GERALD A. LARUE

The coming of the twenty-first century can be given different meanings.[1] For our purpose, it is enough to note that some very vocal Christian groups, basing their claims on notions derived from interpretations of doomsday threats in New Testament, are announcing the proximity of end-time and arguing that the world as we know it will shortly be destroyed by supernatural powers. Subsequently, a new creation will usher in eternal bliss, and happiness for true believers and eternal damnation in hell for the rest of us (Rev. 21:8).

The Christian clerics who ultimately selected and arranged the New Testament writings chose the Gospel of Matthew as the opening document, thereby introducing the

violent end-of-the-age concept with a proclamation by John the Baptizer: "O you generation of vipers. Who has warned you to flee from the wrath to come?" (Matt. 3:7). From that point on, eschatological themes[2] are interlaced throughout subsequent writings, reaching a climax in the words of the visionary who wrote the Apocalypse, the book of the Revelation, where millennium (thousand year) notions are introduced.

> Then I saw an angel coming down from heaven, holding in his hand the key of the bottomless pit and a great chain. And he seized the dragon, that ancient serpent, who is the Devil and Satan, and bound him for a thousand years, and threw him in the pit, and shut it and sealed it over him, that he should deceive the nations no more, till the thousand years were ended.
>
> And when the thousand years are ended, Satan will be loosed from his prison and will come out to deceive the nations . . . (Rev. 20:1–5)

Sacralizing Time

For many modern sciences, such as geology or astronomy, time is endless and measured in millions and billions of years. For this reason the notion of precise beginnings and endings tends to remain elusive or merely descriptive. Ancient Near Eastern religions, on the other hand, attributed sacred symbolic significance to certain numbers.[3] In biblical thought, time is given a precise and determined beginning and end.

"Beginning time," as presented in biblical temple mythology, employed cosmological notions widespread in the Near East several thousand years ago. For example, it was widely believed that in the beginning there was only the eternal (timeless) primeval sea. Biblical time began when, in the midst of the all-encompassing waters, the heavens and earth and all within them were brought into existence by divine decree in six days (Genesis 1).[4] The created world was protected from inundation from the waters above by the disc of the heavens or the firmament (in Hebrew *raqia,* a term suggesting something beaten out of metal), and from flooding from below by the earth. The Genesis 1 format was not an original Hebrew-Jewish construct but was borrowed from the Babylonian creation myth *(enuma elish).*[5]

Another Hebrew temple myth, also borrowed from ancient Sumer and Babylon, described an eschatological or end-time event that came through a universal flood.[6] Angered by human wickedness, the Hebrew-Jewish god, Yahweh, opened the windows in the firmament and unplugged channels to the waters beneath the earth enabling the primeval sea to pour into the hemisphere of earth and sky and destroy all life forms except those saved by the messianic hero, Noah. The flood myth provided temple priests with a teaching tool warning Jews that deviation from their particular "revealed" religion could provoke the deity and bring devastating judgment on the nation. Obedience, on the other hand, produced blessing and hope for a promised "day of Yahweh" when their god would deliver them from oppression and from disharmony within the nation. However, during the eighth and seventh centuries BCE, just at the time when the nation appeared to be most prosperous, Hebrew prophets reinterpreted the popular perception of the "day of Yahweh" and gave it a doomsday import. Their condemnations, which grew out of social conscience concerned with the violation of basic human ethics, transformed the "day of Yahweh" idea into a threat of divine judgment and national disaster which was near at hand (Isaiah 2:11; 13; Zephaniah 1:14ff; Amos 5:18; Hosea 9:5ff; etc.).

In the sixth century BCE Judah was conquered by Nebuchadrezzar, and leading Jews were taken as captives to Babylon (597, 586 BCE). Later, during that same century, after the Jews were freed by Cyrus of Persia and permitted to return to Palestine (538 BCE), the Persian religion of Zarathustra or Zoroaster began to affect the Jewish belief system. Persian teachings about a final end time were incorporated into Jewish theology to develop a new eschatological way of thinking which had, at its heart, the issue of divine justice.

The Principle of Divine Justice

If the god is a good god, a righteous deity in control of the world, why do evil people seem to get away with their willful violations of the divine will, while good people suffer? Why doesn't the deity do something? Or does he?

Hebrew temple religion portrayed Yahweh as a god of the living, not the dead. The dead were past history, existing in a shadowy underworld *(Sheol)* where they no longer had any contact with their god (Isaiah 38:18; Psalm 88:5–6; 115:17, etc.). The god of the living was concerned with justice during this life, not after death. Of course it was apparent that this theory simply didn't work out in real life. Some individuals who flaunted temple law were happy, healthy and successful, while obedient observers suffered and were miserable.

To deal with this apparent injustice, Hebrew culture placed supreme importance on the group (the family, the clan, the tribe, the nation) rather than on the individual. The group, conceived of as a psychic unity with an identity of its own, has been described as a "corporate personality."[7] Individual identity, which came from membership in the group, placed particular responsibilities on each member inasmuch as individual acts were evaluated in terms of their impact on the life and well-being of the group. Thus divine punishment of a wicked person who lived a full and happy life could, in the words of Exodus 20:5, be passed on to descendants up to the third and fourth generations: "I, Yahweh, your god, am a jealous god,

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visiting the iniquity of the fathers upon the children to the third and fourth generations of those that hate me." On the basis of this belief, the prophets (Amos, Hosea, Isaiah and Micah) could warn that the social injustice practiced by the wealthy and powerful would doom the nation. Despite the fact that this legal prescription was incorporated in the Ten Commandments and attributed to the revelation given by Moses, the time came when it was challenged.

The challenges developed over the period of several centuries. The destruction of the northern kingdom of Israel by the Assyrians in 721 was interpreted as an act of divine judgment on that nation and as fulfillment of the warnings of the eighth century prophets. Sometime during the seventh century, a scroll attributed to Moses but actually composed during the seventh century was, apparently, "discovered" in the temple archives. This scroll, which we now believe to be Deuteronomy,[8] contained a new revelation stating that each person was to receive divine punishment for his own iniquities (Deuteronomy 24:16). When Judah fell to Babylon in the sixth century, the prophets Jeremiah and Ezekiel also denied the validity of the corporate personality concept of justice and announced that each individual would suffer for his own sins (Jeremiah 31:29; Ezekiel 18).[9] However, just as it had become obvious to any rational observer that the exercise of divine justice by punishing innocent descendants for the evil behavior of ancestors was unfair and unreal, it became equally apparent that the theory of divine punishment of guilty individuals simply did not really happen in real life.

Another reaction, rejecting standard theologies of divine justice and underscoring the futility of humans trying to understand the ways of Yahweh, appeared in dramatic form in the post-exilic book of Job. Job, a model devout Jew, suffered horrendously because of a wager between the god Yahweh and his son Satan. Job's theological peers argued that his disasters were divine punishments either for something he (who had been adjudged righteous by both Yahweh and Satan[10]) must have done,[11] or because of guilt incurred by his family.[12] Job rejected both arguments and called for justice. Although the deity appeared on stage in the play, Job received no explanation of why he, an innocent man, suffered divine punishment.

The theme of ignorance of the ways of god was echoed in Ecclesiastes, a third century BCE writing that may have been influenced both by Job and by Greek thought. Qoheleth, the teacher, advised his students:

> . . . although God has put in man's mind the quest for that which is hidden, man cannot comprehend what God has been doing from start to finish (3:11) . . .
>
> The fate of men and the fate of animals is the same; as one dies so does the other die for all have the same breath of life. Man has no superiority over the animal, both are void of meaning.[13]
>
> Both go to the same place; all are from the dust and all return to dust. Who knows if the life force of a man ascends upward and the life force of beasts descends to the underworld? (3:19–20) . . .
>
> As for the dead, they know nothing at all, and they experience no rewards and (ultimately) they are not remembered. Their love, their hate, their passions have perished completely, and never more do they have any part in what happens beneath the sun (9:5–6).

Qoheleth's philosophical response to this enigma was:

> I know that there is nothing better for men than to be happy and enjoy themselves so long as they live, and that when men eat and drink and find enjoyment in their work, this is a gift from God (3:12–13).

Qoheleth's realistic, humanistic attitude towards life and living did not satisfy some Jews. They resolved the problem of divine justice and individual responsibility by embracing concepts borrowed from Persian Zoroastrianism.

Ancient Near Eastern religions attributed sacred symbolic significance to certain numbers. In biblical thought, time is given a precise and determined beginning and end.

The religion of Zoroaster or Zarathustra, which was dualistic, became central in Persia during the sixth to fourth centuries BCE when Persia dominated the Near Eastern world. Ahura Mazda (known also as Ormazd or Hormuzd), the god of light and the all-knowing creator and sustainer of the world of good, was pitted against Angra Mainyu (known also as Ahriman), the epitome of darkness and evil. Zoroaster attributed ethical values to these two supernatural opposing forces so that right and wrong tended to have black and white characteristics. By the choices they made, humans, endowed with free choice, became involved in the cosmic struggle of light versus darkness and the truth versus the lie. Individuals aligned themselves either with Angra Mainyu and the powers of darkness or with the Ahura Mazda and the forces of light.

Death marked the time for judgment of the individual's life choices. The soul of the dead person arrived at the Bridge of Separation where the souls of the righteous were sent to paradise; the souls of the wicked went to hell. Beyond these immediate individual rewards and punishments was an eschatological or end-time event.

Zoroastrian mythology depicted time in linear fashion. There was creation time and end-time. Creation time covered four periods of 3,000 years each. The first period marked the golden years under the rule of Ahura Mazda. The second 3,000 years were a time of warfare between good and evil. The next 3,000 years, the beginning of end-time, was marked by the appearance of Zoroaster, who brought new strength into the

cosmic battle. Each of the final 3,000 years was ruled by a posthumous son of Zoroaster. At the termination of the 12,000 years, when the creation process was completed, Zoroaster's third son, Saoshyant, would purify the world, remove all traces of evil and regenerate the world in purity. The physical bodies of the dead would be resurrected and now, united with their souls from both paradise and hell, would pass through a river of molten metal—with the righteous moving as if they were in a warm bath and the wicked experiencing unimaginable torture. Ultimately all would be purified and enter the kingdom of the righteous to live forever in an ageless paradise.

In Zoroastrian theology humans had no real involvement in the final outcome. History was fixed. During the 12,000-year period Ahura Mazda and Ahriman struggled for power and for human souls, but the ultimate outcome was predetermined: Ahriman would lose; Ahura Mazda would triumph.

Even as Zoroastrian teachings were influencing Jewish religion, old mythological beliefs of the dead existing in shadowy Sheol apart from Yahweh were maintained by the Sadducees, the temple aristocracy. For the Pharisees, the Essenes, and the Jesus sect, the new mythology made sense out of human suffering by transforming death into a door to an afterlife where divine justice would be administered. Whether or not the 1,000-year format or millennialism derived directly from Zoroastrian theology cannot be determined, but it is at this point that we move into the field of the apocalyptic (a term that means "unhidden" or "revealed"). Apocalyptic literature purported to reveal signs associated with a predetermined final end-time-signs that could be interpreted by the initiated and that would make clear the ultimate significance of life and living.

Just as the biblical myth of beginning time was borrowed from Mesopotamia, so the biblical myth of end-time was borrowed from Persia.

The Failures of Predictions by Apocalyptic Doomsayers of the Past

Apocalyptic literature has special appeal when society is permeated with social pressures, intellectual conflicts, and frustration. By abandoning a humanistic approach to life, end-time writings and beliefs express loss of faith in the potential of humans to solve their own problems. Blind belief in supernatural powers that are prepared to rescue the faithful tends to offer comfort and hope to lonely, insecure individuals lost in the maze of life. They need only believe and conform. There is no need to attempt to resolve social issues because divine intervention will result in the triumph of good over evil. The fullest expression of apocalyptic literature in the Jewish scriptures is the book of Daniel, which was written about 167 BCE when Jews were under oppression.

The Greek empire established by Alexander the Great in the fourth century was subdivided by his generals. Palestine fell under the jurisdiction of the Seleucid ruler, Antiochus IV. When Jews resisted Antiochus' hellenization program, the Syrian ruler attacked Jerusalem and desecrated the Jewish temple altar by using it to burn pig's flesh as an offering to Zeus. Jews who abandoned any hope in their ability to alleviate their situation took refuge in the apocalyptic teaching that the end of the age was at hand and that their god would rescue them. Their belief enabled them to tolerate current conditions and the potential terrors that lay ahead. Apocalyptic writings, like Daniel, assured them that the evil days would pass because they were in an alliance with the future.

The second century BCE author of Daniel set the scene of his writing in the time of the sixth century Babylonian exile and portrayed Daniel and other Jewish heroes as models of resistance. When arrested and sentenced to suffer and die for their faith, Daniel and his friends were miraculously preserved by the deity. Of course, the second century BCE reality was quite different from the fiction of Daniel. Descriptions of persecution in I and II Maccabees make it clear that there were no miraculous interventions.[14] Orthodox Jews underwent excruciating torture and died horribly for their faith, all the while waiting for supernatural deliverance. Freedom ultimately came through the efforts of those who, having rejected the promise of divine intervention, roused Jews to fight for their freedom.

Following the pattern established by Zoroastrian religion, the Book of Daniel divided history into a series of "ages" beginning with the Babylonian period as the golden age. But human history was in decline and after passing through the silver (Median), bronze (Persian), iron (Alexandrian) periods, humans had arrived at the final stage of corruption—the intermingled bronze-clay (Seleucid) period. Now the god of history would act! Now the end would come! History would cease! God would intervene! Pious Jews would be rewarded and all others—the wicked—would be punished. And should one die before that day of judgment, resurrection would raise up the dead for rewards or punishment. To substantiate this interpretation of history, the author introduced the angel Gabriel (Dan. 8:16f; 9:21ff) who transformed the prophet Jeremiah's prediction that the sixth century Babylonian exile would last seventy years (Jer. 25:11–12; 29:10) into seventy weeks of years or 490 years which would enable the writer to suggest that divine intervention would occur during the second century BCE. Daniel's rough outline of historical periods (which contained some errors) was apparently not challenged. But the author's attempts to predict the future, promising that final deliverance would come through the intervention of Michael, the patron angel of the Jews, were absolutely wrong (11:40ff).

Daniel, a product of the second century BCE, was designed to appear to have been written during the sixth century BCE. If a contemporary Jewish skeptic had asked "Why have we not seen this book before?" the answer was provided in the divine revelation given to Daniel that "the words are shut up and sealed until the end of time" (12:9). The fact that the book was now in the hands of Jewish readers underscored the belief that

they were living in the last days, "the end of time."

Despite the fact that the author of Daniel was wrong and the mythic deliverance day did not come, Daniel was incorporated in the Jewish canon of scripture. The apocalyptic myth has been given new life over and over again through continual reinterpretations of "end-time."

Jews living at Qumran, who were probably Essenes, were among those who accepted the dualistic worldview. The god who created the world also created two antagonistic spirits—the spirit of light and the spirit of darkness—each with hierarchies of angelic or demonic powers struggling for human allegiance. Each person was predestined to affiliate with one or other group, and even those recognized as "Children of Light" were not immune from temptation to sin. In the final battle between the Children of Light (with whom the Essenes identified) and the Sons of Darkness, the powers of light would win and final judgement would come.

New Testament Apocalyptic

New Testament literature was produced between thirty and 100 years after Jesus' death (which is often placed between 29 and 33 CE). Paul's letters, composed some thirty years after the crucifixion, are the earliest New Testament writings and they mark the beginning of the transformation of the Jewish Jesus sect into a mystery religion competing with the mystery cults of the first century. Romans destroyed Jerusalem in 70 CE and the Jesus legends we find in the Gospels were composed after Jerusalem fell and the temple was destroyed—between 75 and 95 CE. The Apocalypse or Book of Revelation is dated around the close of the first century when the Christian sect experienced some persecution by Roman authorities.

Paul and the unknown gospel writers accepted Jewish apocalyptic mythology but added new dimensions.[15] The long-awaited messiah had come in the presence of Jesus, been recognized, been brought to trial before a Roman court, and condemned as a common criminal to suffer a savage death by crucifixion. To explain how the annihilation of their hero figure could be recognized as part of a divine plan for human redemption, Christian writers reached back to a Babylonian ritual and drew on Jewish sacrificial rites.

During their sixth century BCE exile in Babylon, Jewish priests witnessed the Akitu festival, the annual Babylonian springtime ritual inauguration of the new year which included a national purging rite.[16] Babylonian priests transferred the sins of the city and the nation onto a human scapegoat who, bearing the sins of the city and nation, was dispatched into the wilderness beyond the city. Deutero-Isaiah, whose writings have been attached to the prophecies of the eighth century Isaiah-of-Jerusalem, employed the imagery of the sin-bearer (which he probably witnessed as an exile in Babylon) in his description of the suffering servant (Isaiah 52:13–53:12).

During the Persian period, Jewish Temple priests developed their own scapegoat ritual in which, on the Day of Atonement, a goat carried the sins of the nation into the wilderness (Leviticus 16:20–22). Later, Christians employed the image of the sin-bearer and by universalizing Isaiah's words transformed Jesus into the ultimate sin-bearer for the world (Matt. 8:17; Acts 8:32–33; 1 Peter 2:24–25). After the Roman destruction of the temple in 70 CE terminated all Jewish sacrificial acts, Christian writers could claim that Jesus' death constituted the final sacrifice (Heb. 9:11–12, 26–28; 13:12). In still another interpretation, Christian writers tied Jesus' death to the Jewish Passover rite and Jesus became the sacrificial paschal lamb (I Cor. 5:7). The theology that developed out of these expositions implied that one need only accept the reality of Jesus' sacrificial death to achieve redemption and entry into the coming kingdom—no other sacrifices were needed.

But Christian mythology went further. Employing an idea borrowed from Persian thought, the Christian myth proclaimed that the end-time promise of the resurrection of the dead had already begun with Jesus who had not only defeated death and risen from the grave but had physically ascended into heaven to be with God. This heavenly ascension was credible at the time because of commonly accepted concept of a three-story world. From heaven, Jesus would return to resurrect the dead and to judge both the living and the dead. When? The watchword was "soon" (Rev. 1:1; 22:20).

Apocalyptic literature has special appeal when society is permeated with social pressures, intellectual conflicts, and frustration.

Although apocalyptic mythology is found throughout the New Testament and is portrayed in its most organized form in Revelation, the gospel writers gave authority for the idea to John the Baptizer, who introduced the theme in the gospels, and to Jesus, who explained signs of the end of the age and promised his disciples that the new kingdom of God would be ushered in during their lifetime (Matt. 16:28). Jesus was wrong. Indeed, during the second century CE, some Christians asked, "Where is the promise of his coming? For ever since the fathers fell asleep, all things have continued as they were from the beginning of creation." (2 Peter 3:4). All we can say is that from that time on, every prophetic pronouncement of the ending of time has been wrong.[17]

The Basic Issues in Apocalyptic Myth

1. Apocalyptic writings, which are anonymous and portray humans as helpless pawns in historical development, are unlike the warnings of the prophets. The prophets wrote in

their own names, and their doom-sayings always included a conditional "if" referring to the potential for human change and development.
2. Apocalyptic myth assumes that supernatural powers—a god or gods—are directly involved in human affairs eternally evaluating and judging human behavior patterns. Failure to conform to divinely ordained edicts results in punishment by suffering or annihilation.
3. The myth reflects dissatisfaction with the present age and looks to future time when the present state will be changed by a cataclysmic divine intervention marking the end of time.
4. The concept of the future that follows the destruction of the present world is that of a paradise regained—where there is harmony between humans and nature.
5. The myth promises eternal rewards for the faithful or for the chosen.
6. Humans cannot of themselves construct a world of peace and understanding; only by supernatural means can such a state come into being.

Interpreting the Signs Today: What Are the Necessary Signs?

The Roman Catholic Church, the Eastern Orthodox Churches, and the standard brand Protestant Churches have, so far, avoided any spectacular claims for the new millennium.

In November 1994, Pope John Paul II issued an Apostolic Letter titled *"Tertio Millennio Adveniente"* or "As The Third Millennium Draws Nigh" in which he set forth yearly plans leading up to the celebration of third millennium. In item forty-six, he commented:

> Christians are called to prepare for the Great Jubilee of the beginning of the third millennium by renewing their hope in the definitive coming of the kingdom of God, preparing for it daily in their hearts, in the Christian community to which they belong, in their particular social context and in world history itself.

In his next comments, the Pope sounds like a humanist:

> There is also a need for a better understanding of the signs of hope present in the last part of this century, even though they often remain hidden from our eyes. In society in general, such signs of hope include: scientific, technological, and especially medical progress in the service of human life, a greater awareness of our responsibility for the environment, efforts to restore peace and justice wherever they have been violated, a desire for reconciliation and solidarity among different peoples, particularly in the complex relationship between the North and the South of the world.

He then returned to the role of the church:

> In the church they include a greater attention to the voice of the Spirit through the acceptance of charisms and the promotion of the laity, a deeper commitment to the cause of Christian unity, and the increased interest in dialogue with other religions and with contemporary culture.

Whether the papal visits to the various continents and countries is related to the call in the controversial ending of Mark's gospel to preach the gospel throughout the world cannot be known. Certainly American fundamentalists, including the Trinity Broadcasting Network, are seeking to encompass the globe with their teachings through many television stations and the use of satellites.

In fundamentalist churches, modern prophets of doom are not concerned with the theme of justice manifested in apocalyptic literature; they focus on personal salvation and the interpretation of biblical symbols and numbers marking the proximity of end-time. It is important to note that many who write and preach about the end-time have become millionaires. They betray no anticipation of losing the capital they have amassed; their focus is on increasing their wealth as the millennium approaches. For example, as far back as 1981, the income of doomsayer Hal Lindsey was estimated at $180,000 per month from royalties on his book *Countdown* plus another $150,000 per month income from the sale of tape cassettes.[18] His *The Late Great Planet Earth* sold more than 20 million copies. He is a multimillionaire and he is still selling books that simply reinterpret his earlier errors in predicting end-time.

Today's doomsayers interpret almost any news item as a portent. For example, the recent *El Niño* weather patterns are symbolic of end time weather disruptions; the World Health Organization's concern for potential plagues becomes a fulfillment of apocalyptic prophecy. Indeed doomsayers' interpretations are often as irrational as the weird imagery in Revelations:

1. For the doomsayers, Israel is God's timepiece. The rebirth of Israel as a nation, which occurred in May 1948, and the Jewish assumption of control of Jerusalem, which occurred in June 1967, are accepted as a fulfillment of biblical prophecy.[19] Biblical passages are lifted out of context and in a cut-and-paste procedure are made to say what the evangelist wants them to say. Little attention is given to provenance. Prophetic statements composed some 2,000 years ago are interpreted as referring to our present era. Evangelists focus on present problems in the Middle East suggesting that they must be the primary focus of the international community. They argue that if Israel appears to be in danger and the United States pulls away from Israel, the U.S.A. is sealing its doom. (Of course, the existence of the Americas and the United States were unknown to the ancient writers but, we are told, their coming into existence was known to God!)
2. The growth of the European Common Market of twelve nations is, by continuing convoluted interpretations, identified with the ten powers mentioned in Revelation chapter 17.
3. The development of rapid global communication and transportation is said to be an essential preparation for a one-world government under the rule of the antichrist. The development of a common currency in Europe is seen as the beginning of the development of an international cur-

rency that will enable the antichrist to control the economic scene. Doomsayers warn us that one will not be able to purchase anything without the number 666 prefixed to one's personal identity number. The Antichrist is not yet identified but is pictured as one who could rise to power very suddenly. The Reverend Tim LaHaye used the meteoric rise of Ross Perot in American politics as a symbol of the public's desire for a "dynamic, Superman-type" leader who could come into power quickly.

4. The threat of nuclear annihilation points to the potential for global destruction marking end-time. The doomsayers argue that Russia had stockpiled more armaments than any other nation. These weapons, which still exist in abundance, are guarded by an underpaid military who can be bribed to steal the weapons and make them available to renegade nations like Libya.
5. The use of biblical numerology and imagery and the ways in which doomsayers redefine these confusing symbols in Revelation. For example,
   - Three of the four horsemen of Rev. 6 appear in every century—war, famine and pestilence—the first horse, the white horse representing the Messiah, is yet to come.
   - The place of the final battle "Armageddon," often interpreted as referring to the ancient fortress city of Megiddo, may simply be a synonym for Jerusalem. In any case, the locales in the vision are limited to the ancient Near Eastern world. Only by imaginative interpretations can the modern world be included.
   - The beast whose number is 666 has not been identified recently. In the past, individuals ranging from Hitler to the Pope were named. Some wag pointed out that the three names of President Ronald Wilson Reagan—each composed of six letters—could be interpreted as 666.
   - Recently, Hal Lindsey has argued that the description of weird creatures in Revelation 9 demonstrate that the visionary John in Revelations, actually "saw" the military weaponry of today but used first century figures of speech to describe what he could not understand. For example, the giant locusts with scorpion stingers in their tails were first century efforts to describe modern military helicopters.

When Will the Apocalyptic Vision Be Fulfilled?

Efforts to determine end-time have had a long history. In the second century CE Ignatius Polycarp, Justin, and Irenaeus believed they were living in the last days. During the third century Hippolytus calculated that Jesus would return five hundred years after his birth. The speculations continue. In October 1997, a group of Korean Christians waited pointlessly for Jesus to appear. Today there are those who are proposing some possible dates for end-time as the new millennium approaches.

1. On January 1, 2000. As some Christian groups look to that date for the introduction of the end of the age, many secularists are preparing to welcome the new millennium with New Year parties.
2. On December 25, 2000—coinciding with the traditional observance of Jesus' birth. Of course no one knows when Jesus was born. The December 25 date, which had been celebrated in Rome as the birth date of the god Mithra was, during the time of Constantine, taken by the Christians as the birth date of Jesus. In the eastern Orthodox tradition, January 6 was accepted as Jesus' birth date.
3. On May 5, 2000, when planetary alignments will exercise a gravitational pull on the ocean waves.
4. Choose any date, use some imagination, and you can find arguments to support it.

It is important to note that many who write and preach about the end-time have become millionaires.

Conclusion

The Christian Bible is a product of human beings that preserves writings produced by priests of the Jewish temple and finally selected by the Council of Jamnia during the first and second centuries CE (the Old Testament) combined with writings by early Christian believers that were selected after long debates to constitute the New Testament. Predictions of the end of time and the coming of a divine new age have always been wrong:

- They were wrong for the writer of Daniel.
- They were wrong for the Essenes.
- They were wrong for Jesus.
- They were wrong for Paul.
- They were wrong for all of the early Christians.
- They were wrong for Bible interpreters in the Middle Ages and during the Renaissance.
- They were wrong for the prophetic voices raised at various times through this twentieth century.

And, if I may enter the field of prophecy, they will prove to be wrong as we enter the new millennium.

Notes

1. For science, a millennium means only that in the cosmic timetable the earth has circled the sun 1,000 times. Presumably this pattern will continue without interruption. The only prediction of doom for Earth from external forces lies in the potential impact of a huge asteroid. For the secular world, the new millennium concern is with the confusion that may result in business and worldwide communication because of the so-called Y2K bug that threatens to crash those computer systems that use only two digits to record the year in a date. However, these predictions of doom may well be short-lived because experts will solve the problems and life will go on as before.

2. The term "apocalyptic" means "un-hidden" or "revealed." "Eschatology"

deals with doctrines pertaining to end-time or the "eschaton."

3. For a discussion of cultic interpretation of numbers see Pope, Marvin H. 1962. Number, Numbering, Numbers. *The Interpreter's Dictionary of the Bible,* New York: Abingdon Press. Vol. 3 (K–R): 561–567.

4. A more accurate translation of Genesis 1:1–2 than that found in the King James Version of the Bible reads: "When Elohim began to create the heavens and the earth, the earth was unformed and without shape, with darkness covering the sea and the wind of Elohim moving over the waters."

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9. Just how the contradictions between Exodus 20 and Deuteronomy (both of which are ascribed to Moses) were handled during the seventh and sixth centuries cannot be known.

10. Job 1: 8–10, 2:3–6. The counselor Eliphaz argued that because of human imperfection, no one could be righteous before Yahweh (Job 4:17, 25:4).

11. Job 4:7, 11:6, 15:7, 22:5

12. Job 8:4

13. The Hebrew word *hebel,* translated as "vanity" in the King James Bible, refers to that which is as unsubstantial as a breath of air so that one seeks its meaning "in vain"—in other words human solutions are meaningless.

14. I and II Maccabees, which are included in the Roman Catholic and Eastern Orthodox Bibles, are not accepted in the Jewish canon and are placed in the Apocrypha by Protestants.

15. Indeed, Paul combined the prophetic language of the "Day of Yahweh" with the developing Christian apocalyptic theology (cf. I Thess. 5:2; Math. 24:42).

16. For a detailed discussion see Pallis, S. A. 1926. *The Babylonian Akitu Festival* Copenhagen: Andr. Fred. Host & Son; Gaster, T. H. 1959. *The New Golden Bough.* New York: Criterion Books: 555, note 456.

17. For example, Melchior Hoffman, a follower of Martin Luther, announced that final judgment would come in 1533. In more modern times the Jehovah's Witnesses thought the world would end in 1918; recently, a Korean group figured October 1997. For further references see Larue, Gerald A., 1988. *Ancient Myth and Modern Life.* Long Beach: Centerline Press, p.150i.

18. Chandler, Russell. 1981. It's heyday for prophets of doomsday. *Los Angeles Times,* April 8: 1, 26, 27.

19. Deuteronomy 28:49ff, a biblical prophecy misused by Lindsey and others, describes the destruction of Israel that took place during the Babylonian invasions in the sixth century BCE (cf. 2 Chronicles 36:15–23), not the first century CE Roman destruction of the Jewish state. Ezekiel 36–39 is also misused. The writer was concerned with the reconstitution of the state in the sixth century BCE, not to modern Israel. From Zechariah 9–12 (composed during the Greek period fourth and third centuries BCE), Gospel writers lifted messianic references to affirm Jesus' role. Zechariah's apocalyptic imagery, which has nothing to do with Christian millennial fantasies, is misapplied by today's doomsayers. ☐

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New Russian Initiative to Defend Science and Reason

BY PAUL KURTZ, CHAIRMAN, CSICOP

We are pleased to present in the following pages two pieces dealing with the growth of pseudoscience in Russia. During the Soviet period Marxist-Leninist dogma prevailed. The need to develop skepticism and critical thinking about claims to knowledge was not encouraged. With the recent development of a more democratic, open society, a plethora of new paranormal (and religious) cults of unreason have appeared. Yet there does not exist an adequate forum for coping with these manifestations; and there is little scientific expertise in evaluating paranormal claims and insufficient public appreciation for the methods of science, or the importance of skepticism, as intrinsic to the process of scientific inquiry.

I have visited Russia four times since 1989, attempting to establish cooperative projects with Russian colleagues. I am pleased to say that these visits have resulted in the establishment of a Center for Inquiry at Moscow State University, which opened in September 1997. The theme of the inaugural congress was "Science and Common Sense in Russia: Crisis or New Possibilities?" Many of Russia's leading scientists and scholars participated.

The new Russian Center for Inquiry is under the directorship of Valerii Kuvakin, professor of philosophy and chairman of the Russian Humanist Society. The Center publishes a journal entitled *Zdravyi smysl,* which is roughly translated into *Common Sense* or *Critical Thinking.* The program of the Center is designed to defend science and reason, to provide a public resource that will present information to the public, and to cultivate critical thinking. Many members of the Center also wish to use reason to define and defend democratic and ethical values.

In the following article, "Science and Pseudoscience," Professor Sergei Kapitza attempts to explain why irrational beliefs have developed, not only in Russia, but worldwide. This he attributes in part to the rapid changes that are occurring on a global scale. Sergei Kapitza is a Fellow of CSICOP. He has attended our conferences (including the Heidelberg Second World Skeptics Congress) and has published in the SKEPTICAL INQUIRER before. Kapitza is a physicist, a former editor of the Russian edition of *Scientific American,* and vice president of the Russian Academy of Natural Sciences. He moderates one of the most popular TV series in Russia, in which he consistently defends science against pseudoscience.

We also publish following that a remarkable statement recently issued by thirty-two distinguished Russian scientists and philosophers, many of whom I know personally. The statement reflects new efforts by Russian colleagues to present a scientific and rational response to the growth of pseudoscience and the cults of unreason. We are pleased that the statement reflects the influence on CSICOP on their thinking. It is a welcome addition to the efforts of other scientists and scholars in the world who wish to defend the integrity of the sciences and to criticize paranormal pseudoscience.

Science and Pseudoscience in Russia

With the collapse of the Soviet Union and subsequent profound economic crisis, science in Russia is in a difficult state. The rampant social disruption has been accompanied by a veritable flood of pseudoscience. The rise of irrationality and decline of reason may also be part of a wider global trend.

SERGEI P. KAPITZA

Science in Russia is in a difficult state. After the collapse of the Soviet Union, the existing structure of science has to a great extent fallen apart. The hard sciences were intimately associated with the military effort and were part of the military-industrial complex. The soft sciences were connected with the dominant ideology, and have lost much of their substance and message after the demise of Communism. With the profound economic crisis, when at least half of industry is not producing and practically no investment is made in the economy, science is in a precarious, if not desperate, situation.

With rampant social disruption, and millions of people unemployed and displaced, the conditions for developing

Sergei Kapitza at the Second World Skeptics Congress in Heidelberg, Germany.

and promoting science are indeed very poor. Still, the educational system has survived; the schools and universities have retained their students and are sustaining high academic standards. The country has opened up to the world and we now see that the training of our younger generation is definitely up to world standards.

Unfortunately, this well-trained and educated intellectual power is not properly employed. Highly trained scientists leave the country and seek employment abroad. Many of the younger generation seek work in fields where they can make a living but do not follow their training in science or technology. For a traditionally static society, the mobility of this young and promising generation is high. The older generation, well established in the former system, has great difficulty adapting to the new realities of life. In fact, a whole generation, the lost generation of this great period of social upheaval, is now in a very difficult state. It may gradually be displaced by the younger and more active modern generation, who are the real hope for our future.

In the organization of science, the traditional division between science and teaching has become a major issue. The government has stated that the cooperation of science and teaching should be pursued, but unfortunately, due to the conservatism of the whole system, it is very difficult to carry out these policies. The loss of the old ideology has led to a veritable vacuum of ideas, an emptiness and lack of meaning in life, having a deep effect on the young and expressed in the morals of society.

It is in these conditions that we should examine the state of science and pseudoscience in Russia. In the former system there was not much room in such a highly controlled society for pseudoscience. But in the last years of the *ancien regime* pseudoscience emerged, mainly in the guise of astrology, parapsychology, quack medicine, and similar manifestations. The authorities themselves had not only lost control, but in many occasions the practitioners of pseudoscience found support in the decaying system. Some were supported by the military, in bogus and secret projects. These events were clearly symptoms of a deep crisis, and any conscientious observer saw them as a precursor of things to come.

In the present conditions all controls have now gone, no censorship exists, and even the limits of decency are trespassed in the press and on television. The freedom to publish has led to a veritable flood of pseudoscience. Books on various alternative theories, ideas, and teachings are on the market. With the revival of established traditional religions and much greater freedom, bizarre sects spread, especially among the young.

Pseudoscience is even observable in high levels of the academic establishment. A well-known mathematician is publicizing a new chronology of world history where there is no place for the Middle Ages and a thousand years of history are thrown out. These ideas are based on computer studies of manuscripts and astronomical data. In spite of a strong statement of the Academy of Science of Russia and of professional criticism by historians, these works are published and discussed in the mass media. Work on cold fusion and other marginal effects are supported and publicized, for the level of expertise and often the great persuasive power of these pseudoscientists leads to the support of their ideas. Where, then, are the limits to public debate and of professional honesty? Or is this all a transient phenomenon? Out of chaos will a new order finally come? These are not easy issues to resolve. Time and again the public is persuaded, if not fooled, on important matters of professional interest, often amplified by the media.

At the same time numerous pseudo-academies have been set up, from shamanism and black magic to seemingly more respectable headings like "information science" and others. They sound reasonable, but the professional standards practiced are very low and often are really attempts to institutionalize pseudoscience. Unfortunately, these groups manage to get support and capture the attention not only of the media, but also of some political bodies. At the same time, the Academy of Sciences, which is certainly the main body of science and should be the custodian of intellectual standards of a great cultural tradition, has had a very difficult time establishing and propagating its scientific and intellectual authority.

These conditions are only made more complicated and difficult by a lack of coherent science policy. Perhaps in these cases the last vestige of science is the professional honesty and

Sergei Kapitza is the vice-president of the Russian Academy of Natural Sciences. An author of six books, his works range from aerodynamics, magnetism, electrodynamics and accelerators to studies of global problems and population dynamics. He lives and works in Moscow. He has a research position at the Institute for Physical Problems and a teaching position at the Moscow Institute for Physics and Technology. For ten years he was in charge of the Russian edition of Scientific American *and for 25 years has moderated the main Russian TV program on science and society.*

integrity of scientists, who must face these adverse conditions. This is the real and effective factor that will permit science, as a social institution, to get through these difficult years. In these matters international recognition and collaboration are very significant. Of special importance is the support for Russian science by the INTAS collaboration and the Soros foundation based on external expertise. Academia Europaea has brought recognition and moral support to many of those who were at a loss in these years of transition.

On the other hand, it may be thought that these conditions, so manifest in Russia and multiplied by the social collapse, are also the result of a global intellectual crisis, through which European civilization is now passing. Many of these symptoms can be traced to the crisis of rationalism. The criticism of rational thinking and antiscience is not unknown in the West. In Russia we do not as yet have deconstructionism as an influential trend in philosophy, but hypocriticism and challenging conventional wisdom are part of the story. Now, after a few years of such critical approach to the past and present, those who were the most outspoken have failed to deliver any positive message. On a political level this is leading to a disillusionment with the ideas of democracy and the ideals of Western culture. It is now obvious in the arts, and perhaps in no field it is so noticeable as in cinematography. All this may seem to be rather far from science, but it certainly demonstrates the changes in social consciousness now happening, and the changing mores and values of the people.

The most unfortunate thing is that economic decline is leading to a marked shift to the right with the emergence of nationalistic mass movements. If these developments carry on, Russia may follow the example of the German Weimar Republic, a historic analogy that is worth remembering. Thus we see that the symptoms of the pseudoscientific crisis may signal a deep-rooted and socially dangerous development both for reason and democracy.

Finally, what are the real long-term and profound reasons for these irrational developments, the decline of reason at a time when the possibilities for development are so numerous and the promise of science so great? It may be assumed that in facing and, it is to be hoped, resolving these issues a global approach is really necessary. These general trends are hardly ever resolved by the sorts of reductionist explanations offered on a short-term cause-and-effect basis. Perhaps these events have to be seen in the larger perspective, in the *longue duree* of great structural changes in our growth and development. But here we are lacking the time scale to objectively observe these events of our daily concern. Can this loss of relevance and bearings be due to the very rapid changes now happening in the globally connected world—when there is no time for the longer processes of culture to take place in a world overrun by numerical growth, and when evolution has no time to develop by trial and error? Can we suggest that these factors are the reasons for the current flight from reason that are being diagnosed and discussed in this World Skeptics conference?

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Science Needs to Combat Pseudoscience

A Statement by 32 Russian Scientists and Philosophers

Published in *Izvestiya*, 17 July 1998

We, representatives of many sciences and disciplines—astronomers, physicists, chemists, biologists, philosophers, lawyers, psychologists—are concerned by the widespread growth of astrology, alternative medicine, palmistry, numerology, and mystic pseudoscience in Russia and other countries of the world. We wish to draw the attention of the public to the threat of an uncritical attitude to the prophesies and advice of modern "practitioners of the occult sciences," proffered both privately and in the mass media. Those who believe in the dependence of human fate on heavenly bodies, magic substances, or witchcraft need to understand that science can in no way provide support for these beliefs.

In bygone times people believed in and used astrology, alchemy, cabalistic mysticism, and alternative folk medicine. These ideas were a substantial part of the mythological and magical view of the world providing a pre-scientific *weltanschaaung* and cognitive purpose, for science was taking its first steps. People believed that the heavenly bodies were the manifestations of the forces of gods that could magically influence earthly objects. Physical processes seemed to be the product of cryptic "hidden properties," and chemical elements seemed to be the product of magic. People had no understanding of the nature of chemical and physical interactions. Today, when science understands the main causes by which heavenly bodies influence phenomena on Earth, there are no scientifically based reasons to claim that these occult interactions may influence the destiny of humans.

A person's psychophysiological structures are not determined by the position of the stars and planets at the time and place of birth, but by the inherited genetic code and sociocultural factors. Astrology mystically interprets the variations of the geomagnetic field and solar activity that have an effect on human well-being. Solar flares and magnetic storms actually do have an effect on the human psyche and on human behavior, but astrology and quack medicine do not provide an understanding of these phenomena.

Living organisms do manifest a feeble electromagnetic radiation, but there is no known scientific evidence to claim the existence of "biofields" or "psychic energy." The astrological calendar does not correspond to actual physical reality, but only provides archaic metaphorical descriptions of astronomical events. Superstitious beliefs and the uncritical acceptance of coincidences as causative undermine our reliance on the capacity of human beings to realistically face the events of life. Astrologers, parapsychologists, and clairvoyants assert untested claims based on pseudoscience; they organize academies and grant degrees.

Many people believe in clairvoyance, astrology, and other superstitions to compensate for the psychological discomforts of our time. Others seek the advice of outside authorities in making significant decisions. Personal and social problems, with which one cannot cope, drive one to witches, shamans, and quack therapists. The belief in astral forces provides an opportunity to evade the responsibility for choice and absolves people of accepting their own mistakes.

At a time of widespread dissemination of scientific education and great advances in science, we can no longer assume that superstitions will disappear of their own accord. On the contrary, society is now inundated by the "occult sciences." The propagators of pseudoscience and "cryptic knowledge" attempt to take over the mantle, terms, and methods of genuine science. Astrology, for example, attempts to influence political and economic decisions, shamelessly intruding into the private lives of persons. Much of this is encouraged by the mass media, playing on and exploiting human fallibilities.

Mystic pseudoscience is an international malady that has stricken many countries of the world. This prompted a public statement in 1975 criticizing astrology by 186 leading scientists (including eighteen Nobel Prize-winners), which was widely acclaimed throughout the world.

Today it is time for the community of Russian scientists to confront these issues with all their power.

One of the unquestionably great achievements of recent years is the opportunity for people to express their opinions openly. Unfortunately, many people are ensnared by the persuasive power of absurd and dangerous superstitions; they must not be conned by their pseudoscientific attire. No attempts to make magical thinking scientifically respectable can possibly conceal their utter incompatibility with science.

Signed by:

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Testing Dowsing

The Failure of the Munich Experiments

German physicists concluded from their massive experimental study that water dowsers unquestionably have a remarkable, mysterious skill. Those results, however, provide the most convincing disproof *imaginable that dowsers can do what they claim.*

J. T. ENRIGHT

The notion that certain skilled individuals can discover underground water by using a mysterious talent known as "dowsing" (or "witching" or "divining") is widely regarded among serious scientists as no more than a superstitious relic from medieval times. No plausible physical or physiological mechanism has ever been proposed by which such detection might be possible. Nevertheless, the worldwide persistence of this practice through the centuries might lead open-minded people to wonder whether there could be a germ of truth behind the folklore. After all, valuable additions to the modern pharmacopoeia have sometimes been derived from folk medicine, thus proving that not all folklore is unmitigated superstition.

Planning an Experimental Study

Many dowsers in Germany think that the stimuli to which they claim to respond ("earthrays," said to be a subtle form of radiation not otherwise known to science) are potentially hazardous to human health, perhaps even inducing cancer. Hence, in the middle 1980s, the German government brought together a committee to consider how a proper study might be conducted to investigate the possibility that dowsing is a genuine skill. If dowsers can indeed detect (dangerous?) radiation, perhaps they might be able to contribute to research in public health issues.

The outcome of those deliberations was a grant of 400,000 German marks (about $250,000), in 1986, to university physicists in Munich. Generous funding assures a large-scale project, so that even weak effects might become evident; the reputation of university-based researchers for open-minded integrity means that their participation provides credibility that a project managed only by dowsers themselves would not have.

For an open-minded test of claimed extraordinary abilities, the claimants deserve a fair opportunity for success by providing conditions they regard as suitable, and in this regard, the Munich researchers seem to have bent over backward. Experiments designed only by doubters might, of course, leave dowsers with convenient reasons to discount a disappointing outcome. Enthusiasts for dowsing were therefore involved in the planning sessions. When practitioners of various occult "skills" have, in the past, been unsuccessful under controlled testing, they have at times claimed that the research was conducted in a skeptical (by implication, hostile) atmosphere, which interfered with their performances and invalidated the studies. That potential problem did not arise in the Munich experiments because the principal investigators, from the University of Munich and the Technical University of Munich, had publicly gone on record as thinking that dowsing is probably a genuine phenomenon. No hostility there!

Water dowsing ordinarily takes place out of doors, and this raises potential difficulties for meaningful experiments, because no two outdoor locations can be considered fully equivalent replicates; and the essence of proper scientific research is replicated testing to examine reproducibility. Most German dowsing practitioners, however, also claim to be able to dowse the location of water piping in a garden or within a structure, so indoor testing was decided upon.

Another potential problem is that among those who *think* that they have dowsing skill, some may be mistaken or perhaps are even deliberate frauds. To avoid these potential pitfalls, some 500 candidate dowsers were recruited for preliminary testing. That group was winnowed down to forty-three individuals for the final, critical experiments: those who seemed to be most successful in the preliminary tests. Those dowsers all freely participated in the carefully controlled final experiments, which they accepted as suitable to their abilities. There could thus be no basis for subsequent claims that the test program was inappropriate or unfair.

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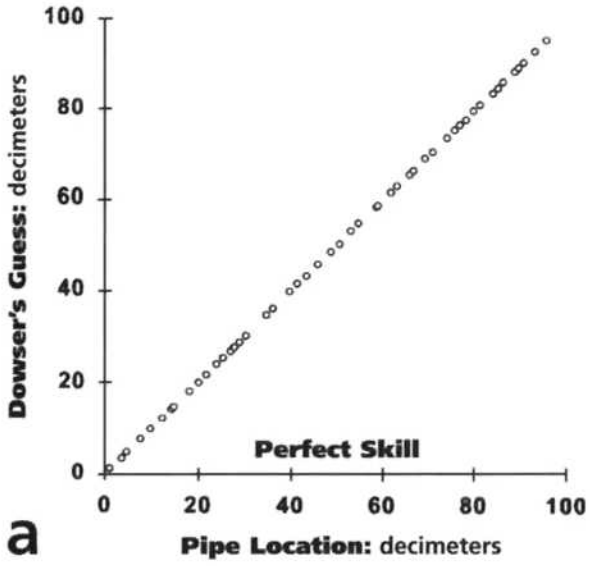
Experimental Design

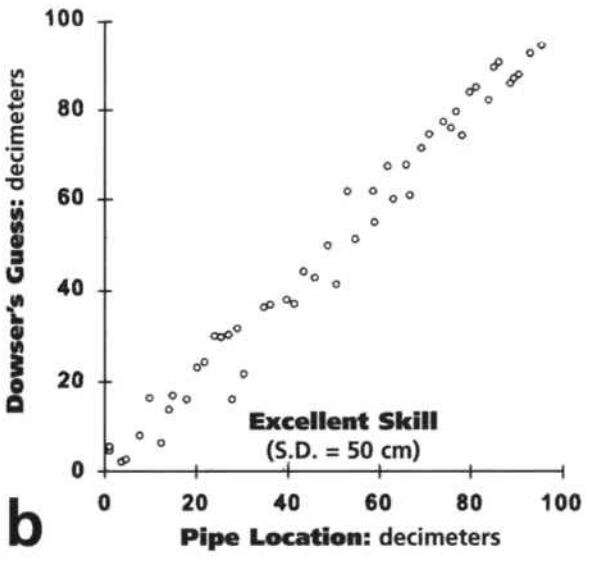
The detailed test procedure was a very simple one. On the ground floor of a large vacant barn near Munich, a ten-meter test line was established, along which a small wagon could be moved; and atop the wagon was a short length of pipe, perpendicular to the line and connected by hoses to a pump that could provide circulating water. Circulating water was chosen rather than still water because the traditions of dowsers postulate that useful underground water supplies are mainly to be found as flowing streams that they refer to as "water arteries" and not just within extensive deposits of permeable sediment, as geologists would tell them. The location of the pipe for each single test was to be determined by a computer-generated random number (although the settings actually used turned out to be decidedly nonrandomly located along the line).

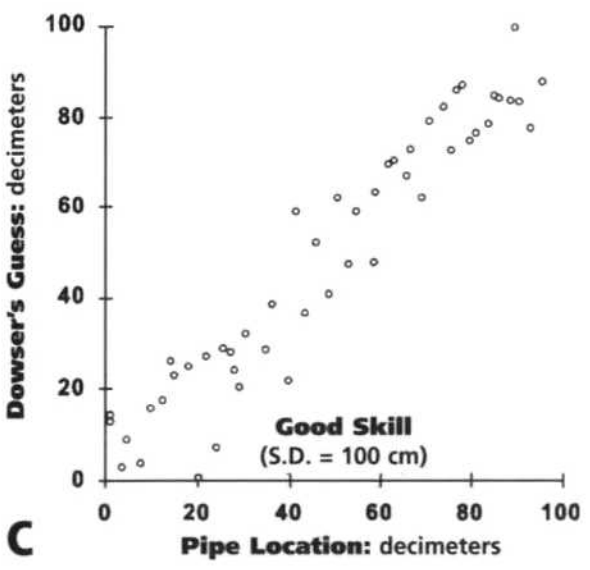
On the upper floor of the barn, directly above the experimental line, a ten-meter test line was established. For the critical final experiments, a dowser was re-admitted to the upper-floor arena each time that the pipe had been repositioned, and was required, with his or her witching stick (or pendulum or other tool of choice), to guess where the pipe on the ground floor was located. A given dowser was tested in a sequence of from 5 to 15 single tests (typically 10), which typically took about an hour. During the two-year program in the barn, the forty-three selected dowsers participated in 843 single tests, grouped into 104 test-series of this sort. Some dowsers undertook only a single test series, selected others underwent more than ten test series.

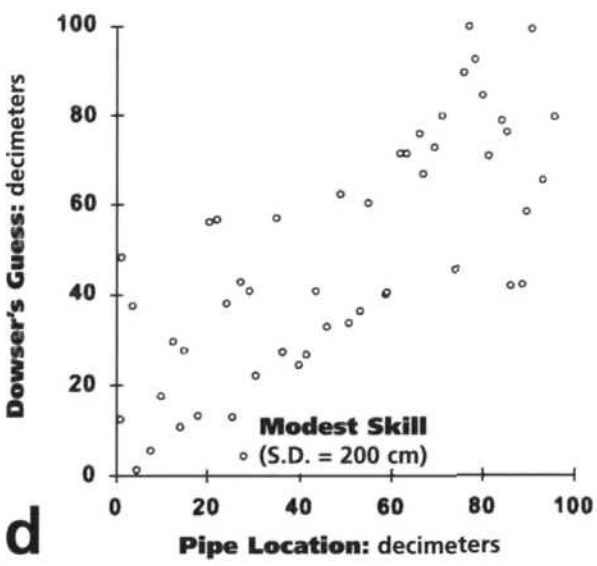
It would seem that such indoor testing should appreciably simplify the dowsers' task. Out of doors, the critical stimuli might be deflected or refracted by intervening layers of soil and rock, but in the barn, the only obstruction was the flooring between stories. Furthermore, in an outdoor setting, the detection of "water arteries," as dowsers envision them, should require remarkable precision. If, say, a 3-meter-diameter stream of water were to be located at a depth of 100 meters, the dowser must achieve precision of less than 1° around the vertical in determining the point of maximal stimuli for drilling, and this apparently implies detection of minuscule changes in stimulus direction and/or intensity. Comparable 1°-precision around the vertical in the barn, however, with the target only, say, about five meters away, would result in uncertainty of less than 10 centimeters around the pipe's actual location.

Before the experiments began, a professional magician was brought in to inspect the entire arrangement for the potential for deception or cheating by the dowsers. As an additional precaution against cheating (such as peeking through cracks in the floor), an experimenter/observer was also present to supervise









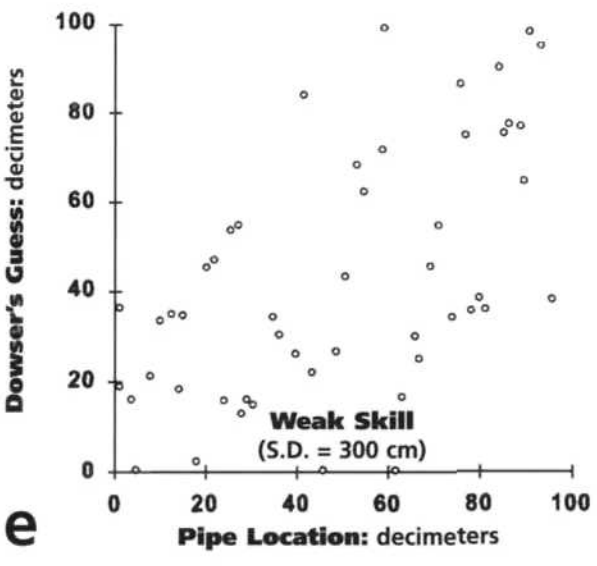


Figure 1: Hypothetical examples of outcomes that might be expected from the Munich dowsing experiments, assuming various arbitrary categories of dowser skill. S.D.: standard deviation of the guesses around perfect correspondence. These graphs provide guidelines with which actual performance might be compared.

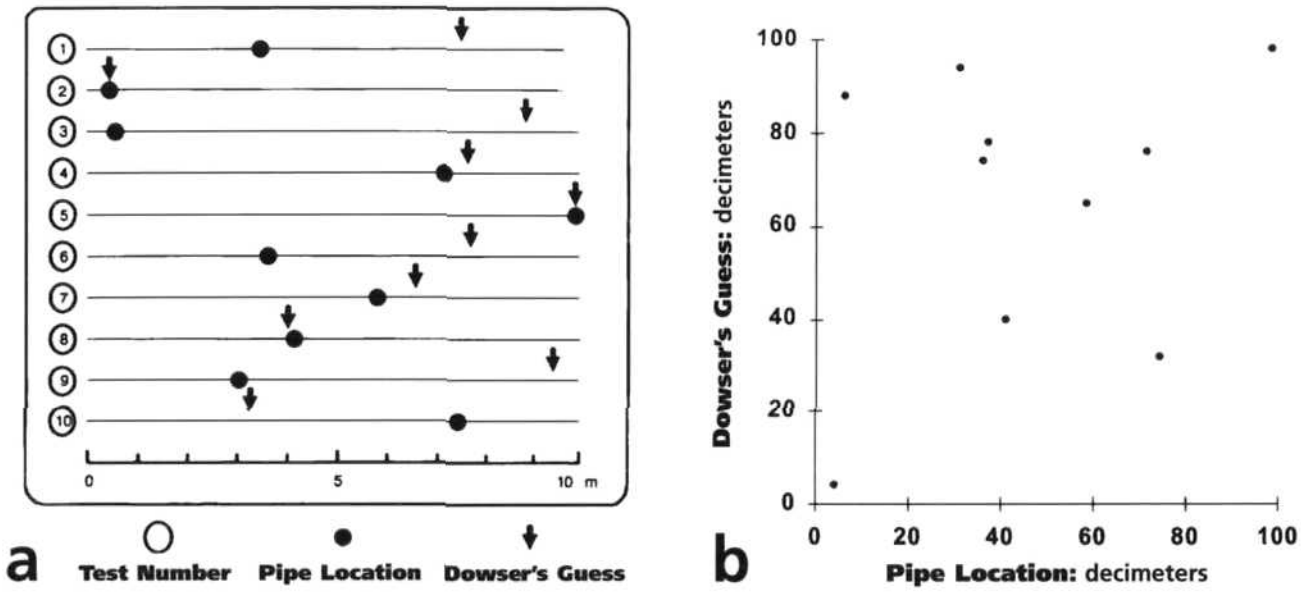


Figure 2: Dowsing results from the second of the four test series undertaken by dowser #99. These results were evaluated by the researchers as the "best" of all 104 series undertaken, and represent the only set of dowsing data from the barn presented graphically in the final research report. A: presentation in the format used by Wagner, Betz, and König (1990); b: presentation in the format of Figure 1 here.

the dowsers' performances, and to record the guesses. Double-blind procedures assured that neither the observer nor the dowser knew the pipe's location, even after a guess had been made; thus, no feedback was provided during the critical testing.

The study involved many thousands of preliminary tests, in which the careful controls of the final critical experiments were relaxed. Often, for example, feedback about success or failure was given in those preliminary tests. Sometimes the pipe was filled with fresh water, sometimes salt water, sometimes even empty; sometimes flow was turbulent, sometimes not; sometimes sand or gravel was mixed in with the water, and so on. The preliminary testing had two purposes: as indicated above, to eliminate those candidates whose trials showed no appreciable dowsing skill (more than 90 percent of the candidates!); and to choose for the selected participants those aspects of the preliminary tests (fluid, flow rate, etc.) that had led to their best initial results. Each individual's final critical testing could thus be based on his or her "optimal stimuli."

Before a critical test series, each dowser was asked to determine whether there were any places along the test line (without pipe present) that seemed to provide stimuli that could be mistaken for the target (presumably indicating natural sources of "earth rays"). In quite a large number of cases, two or three such locations were reported along the 10-meter line. "Earth rays" are seemingly nearly everywhere! When such non-target stimuli were reported, the surrounding regions of the line (typically one meter wide) were then excluded for that dowser's test series as potential test locations. (A given dowser often reported different artifact locations on different days; natural sources of "earth-ray" stimuli are apparently transient.)

An ideal experimental design was frequently compromised, because two dowsers arrived at the barn at the same time. Instead of testing those individuals one after the other, the two dowsers were tested alternately, each pipe setting being used twice in succession. It was assumed that their guesses could be treated as independent because the two individual dowsers were not simultaneously present in the test arena.

If a dowser felt that his or her concentration was waning during testing, the test series could be interrupted or terminated, which apparently happened quite often. Thus, it seems quite obvious that many accommodations were made to the wishes and whims of the dowsers and the experimenters. Nevertheless, many aspects of sound experimental design were built into the critical testing: double-blind protocol, no feedback about success or failure, randomized (well, sort of!) pipe settings, replicated testing of the same dowsers on different days, and a large-scale program (843 critical tests) so that small sets of "good" results would not deserve undue attention.

It is conceivable that the noise of water turbulence (sometimes with gravel in the water) could have provided localized auditory information during the testing. Another concern is that the experimenter supervising the dowsers may not have been properly "blinded," when aware that identical pipe settings were being used for two dowsers in alternation. If truly remarkable dowsing success had been achieved in the experiments, such concerns would deserve careful attention. In fact, however, the overall negative outcome suggests that any residual defects in the experimental design usually had no important impact on the outcome.

Expectations

Proper planning requires that one consider in advance what sort of results might arise from experiments of this design, if dowsing were to be a real, reproducible phenomenon. Several examples of hypothetical outcome are shown in Figure 1.

"Perfect" skill (the equivalent of using Superman's X-ray vision to look through the flooring) would lead to a perfect correlation between the dowsers' guesses and pipe locations (Figure 1a); weak skill (with a standard deviation of 3 meters along a 10-meter test line) would produce broad scatter around the same diagonal line (Figure 1e), and intermediate skill levels would involve lesser scatter about that diagonal line in this kind of plot. Note that while the "Weak-Skill" results are very scattered, they do not look random (nor are they: $r = 0.57$, $p < 0.001$) because of the vacant regions of the graph in the upper-left and lower-right corners, an issue that arises again below.

Results and Interpretation by the Experimenters

In the final report on their dowsing experiments, submitted to the granting agency (Wagner, Betz, and König 1990), the researchers concluded that most dowsers did not do particularly well in the experiments. That report, however, still painted a very positive picture of the overall outcome. The following quotation is a translation of the German text:

> Some few dowsers, in particular tasks, showed an extraordinarily high rate of success, which can scarcely if at all be explained as due to chance . . . a real core of dowser-phenomena can be regarded as empirically proven . . . (5)

The evidence provided for this interpretation consisted of a plot of results from a single test series (out of 104 available), data shown here as Figure 2; and a table summarizing the purported statistical significance of each of the 104 test series. (This summary is based on nonstandard statistical methods that were conspicuously fitted to the data. More conventional statistical tests suggest less interesting conclusions [Enright 1995].) The peculiar plot in the report (Figure 2a) gives the visual impression of very good correspondence between observed and expected results. The re-plot in Figure 2b places those data in a more revealing context. Half of the results in Figure 2b (5 tests of 10) do indeed resemble an ideal hypothetical outcome (Figure 1a or 1b), but it deserves emphasis that Figure 2 cannot be considered "typical" but instead represents the very "best" results, consisting only of ten tests out of 843, from one test series out of 104. (In 843 spins of a roulette wheel, at least one sequence of 10 results that includes several seemingly exceptional events might be expected to arise by chance alone.)

A Broader Look at *All* the Data

Presented in Figure 3 is a plot of all 843 test results. The human eye is remarkably adept at detecting pattern in plots like this. Note, for example, groups of points that seem to follow curvy lines through certain regions of the graph. Resemblance to the expectations of Figure 1, however, is decidedly absent in Figure 3. Instead, the visual impression is that these results seem to be distributed more or less at random. In order to examine that interpretation, the actual results can be compared with the outcome of genuine randomization. To that end, the dowsers' actual choices were randomly paired with pipe settings from other test series. (The x and y values of points shown in Figure 3 were thus randomly intermixed.) The results of two such randomizations are shown in Figures 4a and 4b. It would be difficult to defend a claim that the actual results (Figure 3) show better concordance with expectations (Figure 1) than do the randomizations of Figure 4.

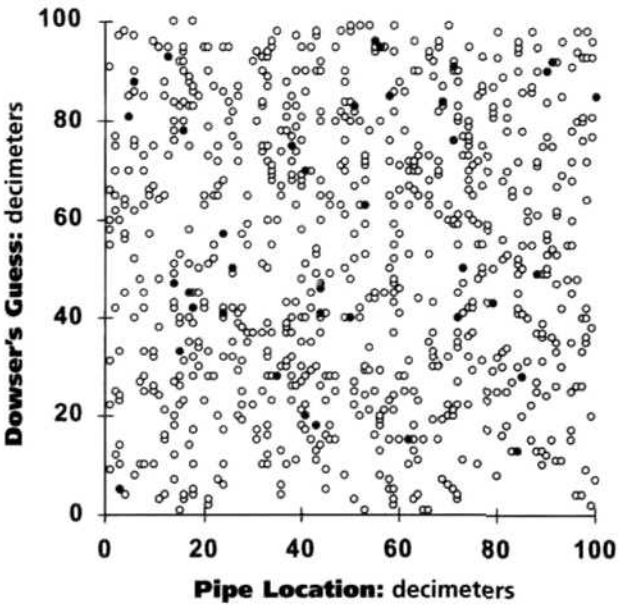


Figure 3: Results from all of the 843 tests in the Munich barn, plotted in coordinates like those of Figure 1. Filled symbols represent two data points at identical coordinates.

To depend on what seems evident by inspection, however, may seem like an unrigorous approach. As an elementary form of quantification, the coordinate system of Figure 3 can be divided into squares, each 2.5 meters on a side, and the enclosed data points counted. Some of those counts are presented in Figure 5. Recalling that even weak skill should produce very few observations in the upper left and lower right regions of such a graph (Figure 1e), those two corner quadrats in Figure 5 can be summed. The total (90) turns out to be greater than the sum of counts in the upper right and lower left (87), so these counting data could even be interpreted, if one were so inclined, as suggestive of weak *anti*-dowsing skill.

A Few Unusually Talented Individuals?

The researchers in the Munich study would probably protest against this treatment of the data by noting that outstanding performances like these shown in Figure 2 have been obscured by results from unskilled candidates. That objection falters when one recalls that Figure 3 includes only the final tests of those forty-three dowsers (out of some 500 candidates) who were selected on the basis of preliminary testing as being the most skillful. Nevertheless, the possibility of unusual skill by only a very few individuals deserves careful scrutiny. In the tabulation of the final report, there were two other test series (in addition to that shown in Figure 2) that the researchers themselves evaluated as being particularly impressive. Results from all

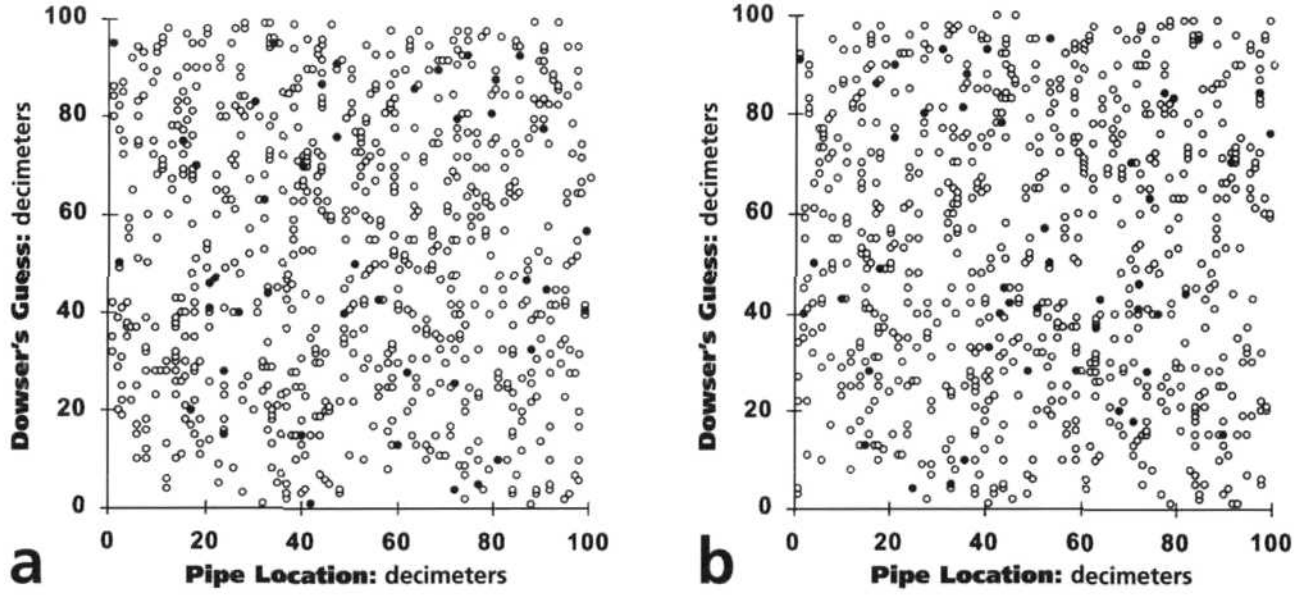


Figure 4: A and b: Two sets of results from complete randomizations. Dowsers' guesses were paired randomly with pipe locations from other test series. Filled symbols represent two data points at identical coordinates.

three of those test series are presented in Figure 6a. Furthermore, there were four other test series (from three other dowsers) that were considered by the researchers also to indicate lesser but nonetheless remarkable skill; those results are summarized in Figure 6b. These two graphs of the very "best" test series present the outcome of the entire research program in its most favorable light. Despite many errors, there are indeed an impressive number of guesses that were not far from the pipe's actual location.

Do those results justify the assertion of the final report that "some few dowsers" were remarkably successful? Decidedly not! Each of the six dowsers who contributed to the data shown in Figures 6a and 6b participated in other test series, and the outcomes of those replicated series by those same dowsers (Figures 6c and 6d) seem to be quite unimpressive: just as scattered as the overall outcome (Figure 3). What it amounts to, then, is that among the 104 test series, there were several that seemed somewhat interesting, but those dowsers responsible could not reproduce that kind of result in other comparable tests. And seven series out of 104 (each with a probability, as evaluated by the peculiar statistical test of the researchers, of less than 0.05) is not appreciably different from what might be expected due to chance alone from ordinary statistical testing. So dowsing "skill" in the Munich experiments proved to be unreproducible across a spectrum of 500 candidates, as well as within a group of forty-three individuals selected because they initially seemed to be particularly talented (Figure 3); nor was it reproducible even by those six special individuals who on one occasion or another seemed to have guessed relatively well.

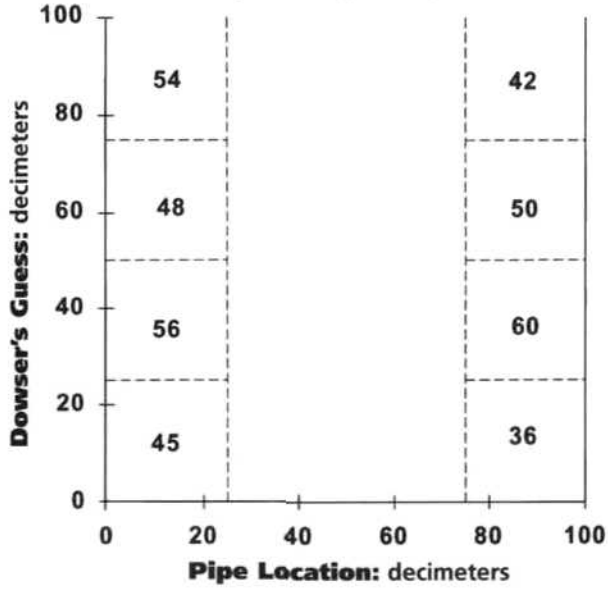


Figure 5: Numbers of dowser guesses in selected quadrats of Figure 3, based on subdivision of the coordinate system into squares, each 250 centimeters on a side.

A Simple Alternative Strategy

There is another way of evaluating the results from those dowsers who produced the "best" test series of Figure 6. Suppose that they had always left their dowsing equipment at home in the closet, and had simply, in each and every test, just guessed that the pipe was located exactly at the middle of the test line. As shown in Figure 7b, all six of the "best" dowsers would have done better on average by making mid-line guesses than achieved by actual dowsing, in terms of the root-mean-square error, a commonly used index of reliability (similar to the standard deviation).

The root-mean-square error puts particular emphasis on gross mistakes, but these results can also be evaluated in terms of a different criterion that does not have that property: average absolute values of the errors. (Absolute values are preferable to simple averaging of errors; simple averaging would mean that an error of two meters to the left and another two meters to the right of the pipe might be regarded, on average, as perfect performance.) On the basis of this absolute-value criterion, as

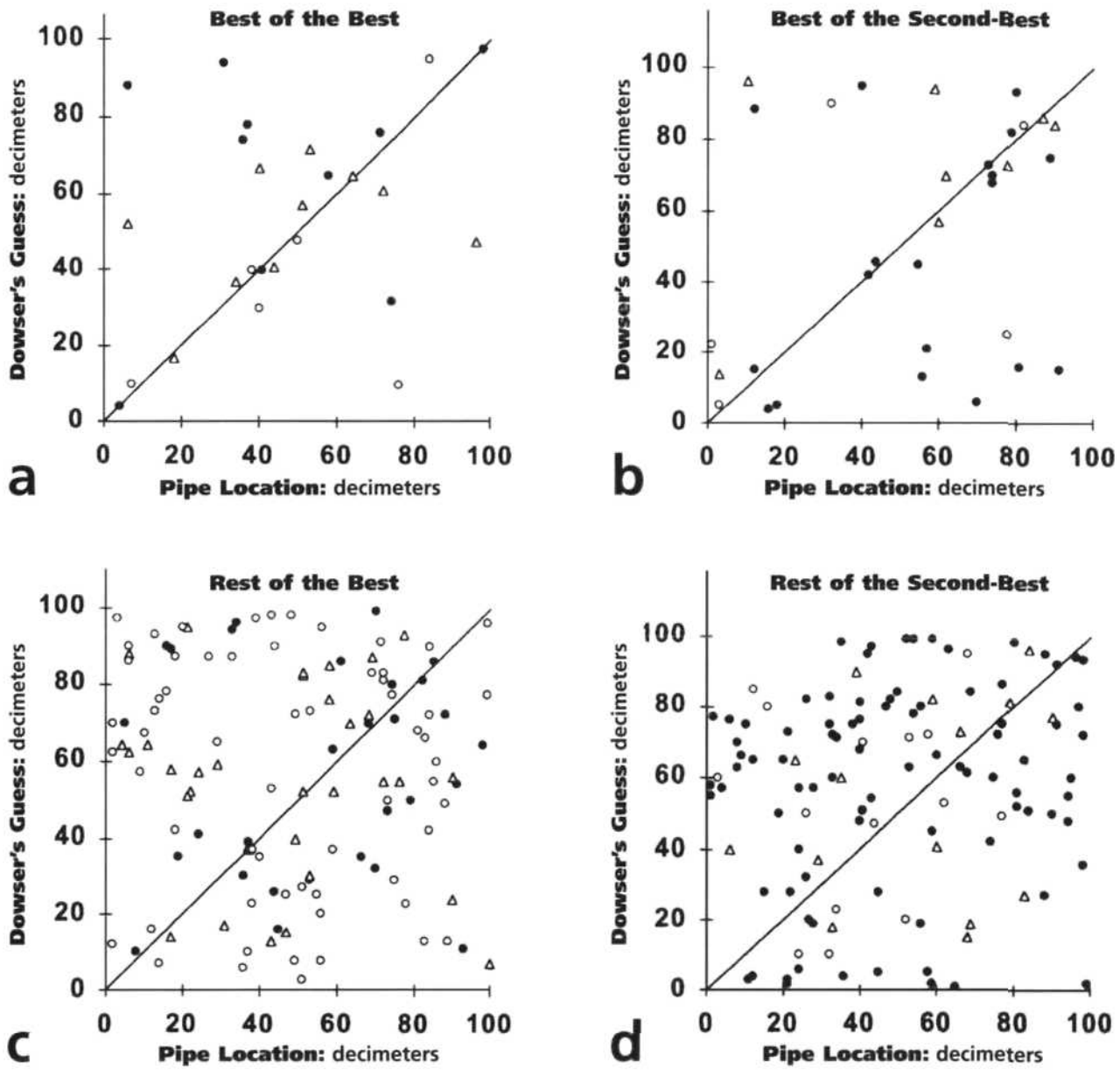


Figure 6: Selected examples of dowser performances. A: results from the three data sets that the Munich researchers considered "best" of all 104 series; b: results from the four test series, by three dowsers, that the researchers evaluated as also being exceptionally "successful"; c: Results from the other test series in which the dowsers of part a participated; d: Results from the other test series in which the dowsers of part b participated. In parts a and c, filled circles represent Dowser #99 (whose results are also presented in Figure 2), open circles represent Dowser #18, and open triangles represent Dowser #108. In parts b and d, filled circles represent Dowser #23, open circles represent Dowser # 110, and open triangles represent Dowser #89. Separate graphs of the results of these six individual dowsers are presented as Figures 2 and 3 in Enright, 1995. There is no hint in those plots that any one of the six was appreciably more or less successful than the others.

shown in Figure 7a, five of the six "best" dowsers would have made smaller errors relative to the pipe by using the mid-line strategy than they actually made with their dowsing tools. And what about the sixth, whose dowsing was somewhat better than middle-of-the-line guesses (#89)? Those results from actual dowsing were on average 4 millimeters better than mid-line guesses would have been. An average improvement of 4 millimeters (0.16 inch) by one dowser out of six (or out of forty-three, or out of 500) along a 10-meter test line scarcely seems worth the time and effort that the researchers and the dowsers invested in this project, nor worth the 400,000 marks that the German taxpayers invested in the study.

On the basis of these results (Figures 3, 5, 6 and 7), then, the Munich experiments constitute as decisive and complete a failure as can be imagined of dowsers to do what they claim they can.

A Sad and Sorry Postscript

Professor Betz (the primary spokesman for the Munich study) and his colleagues have published a response (Betz, H.-D., König, H. L., Kulzer, R., Trischler, R. and J. Wagner 1996) to

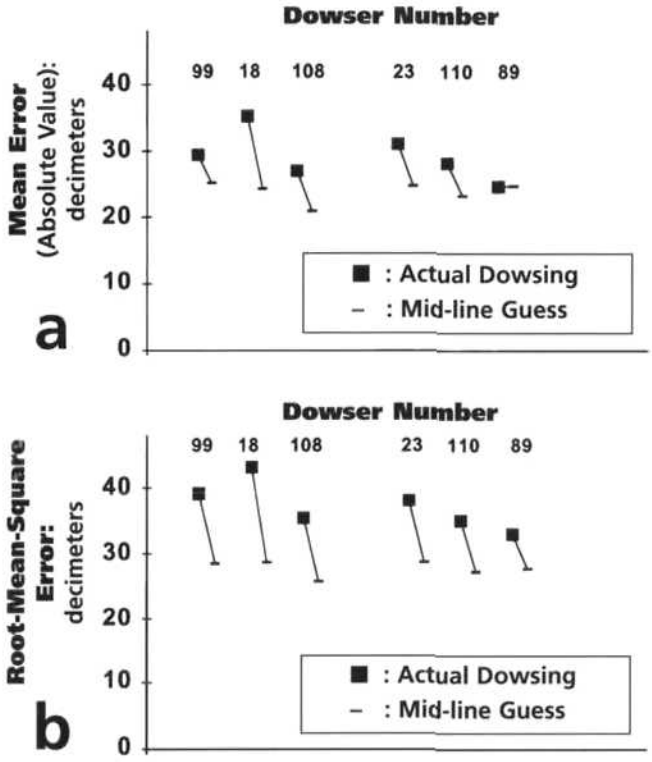


Figure 7: A: Dowser errors (averages of absolute values, indicated by filled squares) compared with errors that would have been made by guessing that in each test, the pipe was located exactly at the middle of the test line (also average absolute values, indicated by short horizontal bars). B: Root-mean-square errors made by the dowsers compared with R.M.S. errors that would have resulted from guessing in each test that the pipe was located at the midline, with symbols as in part a.

my critique of their results (Enright 1995). That defense is a relatively feeble one (Enright 1996), but such exchanges are a normal part of scientific controversies. Subsequently, however, Professor Betz (1997) published a paper in a fringe journal that crossed the ethical boundaries that usually characterize the scientific enterprise. In that article, he asserted that as a result of extensive scientific correspondence, I had conceded the validity of his own analyses and interpretations of the Munich dowsing data.

That statement is absolutely and categorically false. My only correspondence with Professor Betz (or anyone in his laboratory) since the publication of my original critique (Enright 1995) consists of an e-mail message sent him in July 1997, which dealt only with my request for documentation of an apparently implausible assertion about statistical procedures that had been attributed to him. He did not respond to that message, and so I re-sent the same message in August 1997, and again he did not respond. Two unanswered e-mail messages from me clearly do not constitute an "extensive scientific correspondence." And I have never, in publication, in correspondence, or in casual conversation even hinted that I accept Betz's analyses and interpretations of the Munich dowsing data. The results presented here as well as in the formal scientific literature (Enright 1995, 1996) provide such a clear demonstration *against* real dowsing skill that to assert that I had retracted my critique is both a false and an insulting assertion.

Conclusion

The Munich dowsing experiments represent the most extensive test ever conducted of the hypothesis that a genuine mysterious ability permits dowsers to detect hidden water sources. The research was conducted in a sympathetic atmosphere, on a highly selected group of candidates, with careful control of many relevant variables. The researchers themselves concluded that the outcome unquestionably demonstrated successful dowsing abilities, but a thoughtful re-examination of the data indicates that such an interpretation can only be regarded as the result of wishful thinking. In fact, it is difficult to imagine a set of experimental results that would represent a more persuasive *disproof of the ability of dowsers to do what they claim.* The experiments thus can and should be considered a decisive failure by the dowsers.

It seems very unlikely that any future careful experimental study of dowsing will produce results more favorable for the practitioners than the Munich experiments. An atmosphere more sympathetic to the dowsers, with so many concessions to their whims, seems hard to imagine. In view of the outcome of those experiments, it is very unlikely that any sponsor would ever provide funds for an even larger-scale study, such that very weak skills (which might conceivably have vanished into the statistical noise here) could be uncovered. (It is noteworthy that the U.S. Geological Survey concluded much earlier [Ellis 1917] that further testing of dowsing " . . .would be a misuse of public funds.") It seems appropriate, then, to reiterate here the general conclusion originally drawn from these analyses (Enright 1995):

> (These) . . . experiments are not only the most extensive and careful scientific study of the dowsing problem ever attempted, but—if reason prevails—they probably also represent the last major study of this sort that will ever be undertaken. (Enright 1995, 369).

Because of the vigor, however, with which Professor Betz and colleagues defended their positive conclusions (Betz et al. 1996), and in view of the discouraging history of other claims about the occult, one may have residual doubts, as do I, about whether reason will prevail in this arena (Enright 1996).

Acknowledgments

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A Fallibilist Among the Cynics

Proponents of the Higher Dismissiveness contend that the concepts of truth, rationality, evidence, and fact are nothing but ideological humbug. Yet there's no need to give up on the objectivity of knowledge, truth, evidence, etc., provided you're fallibilist enough. What's required is a realistic understanding of how difficult and demanding successful inquiry can be.

SUSAN HAACK

Out of a contrite fallibilism, combined with a high faith in the reality of knowledge, all my philosophy has always seemed to grow. (C. S. Peirce)[1]

Nobody seriously doubts the possibility, or the usefulness, of finding things out; that is something we all take for granted when we inquire about our plane schedule, the state of our bank account, the best treatment for our child's illness, and so forth. Nobody doubts, either, that sometimes, instead of really looking into things, people fudge, fake, and obfuscate to avoid discovering unpalatable truths; that is something we all take for granted when we ask who paid for this reassuring study, who stands

to gain from an official inquiry minimizing that scandal, which party this expert witness works for, and so on.

Of late, however, radical feminists, multiculturalists, sociologists of science, literary theorists, and (I am embarrassed to say) a good many philosophers as well—though they look into questions about their plane schedules, bank accounts, medical treatments, etc., just like everyone else—profess to have seen through what the rest of us take for granted. All that high-minded talk about concern for truth, respect for evidence, finding out how things really are, they tell us, is nothing but a rhetorical smoke-screen disguising the covert operations of power, of interests. Those of us who are still taken in, who feel no need for precautionary scare quotes when we refer to truth, evidence, etc., are "old-fashioned prigs" who don't have a clear view of the matter.[2] And as if that weren't bad enough, the radical feminists and multiculturalists among the revolutionaries hint that such naïveté reveals complicity with sexism and racism, and the radical sociologists of science that admiration for the achievements of the natural sciences reveals reactionary conformism with the military-industrial complex.

An old-fashioned prig like myself sometimes feels—well, like the proverbial cannibal among the missionaries; for within academia such ideas are now almost an orthodoxy, taken in some quarters as indications of intellectual sophistication and moral rectitude. Recently I heard my dean, a physicist by training, express unease at the suggestion that the mission statement for the College of Arts and Sciences include the phrase "concern for truth." The word makes people nervous, he explained, and they're bound to ask, "whose 'truth'?" A sociologist colleague, seconding these reservations, observed that while of course his research advances knowledge, he isn't concerned with "truth." (When I last looked, however, the university newspaper was still called *Veritas,* not "*Veritas,*" in scare quotes.)

Unless your conclusions are true, they aren't knowledge, but only purported knowledge; and it doesn't follow from the fact that people disagree about what is true, that truth is relative to perspective. Still, though diagnosing the fallacies and ambiguities of the Higher Dismissiveness[3] is necessary work, the best defense against its extravagances is a realistic understanding of our epistemic situation: of how difficult and demanding successful inquiry can be, how complex, confusing, and ambiguous evidence often is. For only such an understanding can make manifest what is, I believe, the heart of the matter: that *there's no need to give up on the objectivity of knowledge, truth, evidence, etc., provided you're fallibilist enough.*

Again and again, proponents of the Higher Dismissiveness transmute true, fallibilist premises into false, cynical conclusions: what is accepted as known fact isn't always so, *therefore* the concepts of knowledge and fact are ideological humbug; our judgments of the quality of evidence depend on our background beliefs, *therefore* there are no objective standards of evidential quality; science isn't sacred, *therefore* it must be a kind of confidence trick . . .

To inquire well, to come up with plausible explanatory conjectures and to make a good judgment of how likely it is that a conjectured explanation is true, requires both creativity and respect for evidence—skill, care and persistence in seeking it out and assessing its worth, responsiveness to where it points. Successful inquiry is difficult and demanding; and though our capacity to inquire is both our most distinctively human and our most valuable trait, we very often go wrong.

The obstacles include not only our cognitive limitations, but also our failures of will. Sometimes we don't want to know the answer to our question badly enough to take sufficient care in looking, checking, testing, thinking; sometimes we don't really want to know; and sometimes we *really* don't want to know. The truth can be inconvenient, awkward, unpalatable, painful. Rather than really looking into things, people often skimp, fudge, or fake it—think of the detective who doesn't really want to know who committed the crime, just to collect enough evidence to get a conviction, or the academic who is less concerned to find out the causes of racial disharmony than to get a large grant for investigating the matter.

That's why intellectual integrity is valuable: a person of intellectual integrity, if he thinks some question needs looking into, will be disposed genuinely to inquire, really to seek the truth of the matter; his will and his intellect, instead of pulling apart, will work together (the suggestion of wholeness carried by "integrity" is exactly right). But even with the best will in the world, even when we really want to know, we make plenty of honest mistakes as well as plenty of dishonest ones.

How so? Human senses, memory, imagination, and powers of reasoning are limited. With ingenuity we can extend our natural powers by means of microscopes, tables of logarithms, computers, etc.; but our ingenuity is limited too. And the complexity of evidence challenges our inferential capacities. Think of the meteorite that caused such a brouhaha among space scientists a while back. Does it really supply evidence that there was once bacterial life on Mars billions of years ago, or did it pick up bacterial traces while it was in Antarctica—or is what looks like evidence of bacterial life just an artifact of the instruments? What are the grounds for thinking that the gases it gives off when heated show it comes from Mars; that it had been in Antarctica for so many thousand years; that this is what fossilized bacteria droppings look like?[4]

Evidence isn't linear and one-dimensional, like a mathematical proof, but complex and ramifying, more like a crossword puzzle. The clues are the analogue of experiential evidence, i.e., what a person sees, hears, etc.; already completed

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intersecting entries are the analogue of his reasons, i.e., background beliefs. How justified a person is in a belief depends on how well it is supported by his experiential evidence and his reasons (analogue: how well a crossword entry is supported by its clue and any already-completed intersecting entries); how justified those reasons are, independent of the belief in question (analogue: how reasonable those intersecting entries are, independent of the entry in question); and how much of the relevant evidence his evidence includes (analogue: how much of the crossword has been completed).[5]

The quality of evidence is objective: how supportive it is of the proposition in question, how independently secure, and how comprehensive. But our judgments of the quality of evidence are perspectival; they depend on our background beliefs. Suppose you and I are doing the same crossword. We are both trying to fit each entry with its clue and other intersecting entries; but since we have filled in some long, much-intersected entry differently, we disagree about whether this other entry's ending in an S, or its ending in a D, should count in its favor. Now suppose you and I are both on a hiring committee. We are both trying to assess the candidates' competence and honesty; but since you believe in graphology and I believe it's bunk, you think how a candidate writes his G's is relevant to whether he is honest, and I think it's utterly irrelevant. Whether the way he writes his G's *is* relevant to his honesty depends on whether graphology is *true;* whether you *judge* it relevant, however, depends on whether you *believe* graphology is true.

Everyone who inquires into how some aspect of the world is—scientists, historians, detectives, investigative journalists, and the rest of us—is working on some part of the same vast crossword. Here and there their entries intersect: so a historian relies on chemical tests to determine the age of a document, a detective relies on DNA evidence to rule out a suspect, medical scientists rely on an amateur historian's family tree to trace the defect responsible for a rare pancreatic disorder.[6]

The natural sciences have been the most impressively successful of human cognitive enterprises; indeed, their successes have been so impressive that we sometimes use the word "scientific" as an all-purpose term of epistemic praise, meaning "strong, reliable, good." But the natural sciences aren't epistemically privileged. They don't set the standards of good evidence and well-conducted inquiry; rather, they have earned their epistemic distinction, coming up with explanatory theories well anchored in experience and interlocking surprisingly with each other.

Natural-scientific inquiry is a thoroughly human enterprise, fallible and messy, its progress ragged and uneven. There is no uniquely rational method of inquiry or mode of inference available to scientists but not the rest of us. Natural-scientific inquiry is like empirical inquiry generally—only more so. The natural sciences have built on earlier results to devise instruments of observation, techniques of mathematical, statistical, and computer modeling, and analogies, metaphors, models, and diagrams—extending evidential reach, amplifying reasoning powers, empowering the imagination; the phrase that comes to mind is, "nothing succeeds like success."

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Every one of us, in the most mundane of everyday inquiry, depends on others. But here too natural-scientific inquiry is "more so." It is the work, cooperative and competitive, of a vast community, within and across generations—without which each scientist would have to start the crossword alone and from scratch. Natural-scientific inquiry is social in another way as well: not conducted in a vacuum, but in a broader social setting that can influence what questions get investigated, what research gets funded, what results are widely publicized, and sometimes what conclusions are reached. Scientific research gets more and more expensive, so that only governments and large commercial enterprises can afford to fund it; more scientists find it possible to make large fortunes from their discoveries; the expert-witness business booms; an explosion of publications puts the peer-review system under strain. There is no guarantee that the mechanisms that have, thus far, proven more or less adequate to sustain intellectual integrity will continue to do so.

There are no grounds for complacency. But there are no grounds, either, for the disdain of science and the factitious despair of the possibility of honest inquiry urged by the Higher Dismissiveness, a despair that has at its root a refusal to accept that the less-than-perfect—fallible inquiry—is a lot better than nothing at all.

What passes for known fact, truth, objectively good evidence, often is no such thing and sometimes is simply what it suits the powerful to have accepted as known fact, etc.. Proponents of the Higher Dismissiveness conclude that the concepts of truth, rationality, evidence, fact, etc., are nothing but ideological humbug. To call a statement true, they tell us, is just to make a kind of power grab on its behalf, to give it "a rhetorical pat on the back."[7] But this dreadful argument—I call it the Passes For Fallacy—is not only fallacious but self-undermining; for if it were the case, as the conclusion says, that the concepts of truth, fact, etc., are purely ideological, then it couldn't be really-and-truly true, as the premise says, that sometimes what passes for truth, for known fact, etc., is no such thing, nor could we have objectively strong evidence for believing this is so.

When the Passes For Fallacy is stated plainly, its fallaciousness is obvious. Usually, however, as shorthand for what is accepted as knowledge, what passes for truth, etc., the cynics write of "truth," i.e., so-called "truth," of "knowledge," i.e., so-called "knowledge," and so on. The effect of the scare quotes is to neutralize the implication of success ordinarily carried by such words:[8] knowledge must be true, but "knowledge" needn't be; facts must be so, but "facts" needn't be. As the scare quotes become ubiquitous, the difference between truth, or knowledge, and (so-called) "truth" or (so-called) "knowledge" is forgotten; "truth," "knowledge," etc., acquire that characteristic

sneering tone—"yeah, right!"; and the Passes For Fallacy starts to sound like a valid argument instead of the self-undermining non sequitur it really is.

Those ubiquitous scare quotes also encourage the fashionable idea that there is no one truth, but many incompatible truths. For though it is tautologically false that there are incompatible truths, it is perfectly true that there are incompatible "truths." It is perfectly true, also, that there are different, but compatible, truths about the world. No cynical conclusion follows.

And those scare quotes enhance the plausibility of certain forms of relativism. It makes sense to talk of what is taken for true, what is accepted as relevant evidence, what passes for knowledge, only relative to some person or group of people. So if you don't distinguish truth and "truth," good evidence and "good evidence," knowledge and "knowledge," it can easily seem to follow that truth, evidence, knowledge, etc., make sense only relative to an individual, context, or culture, i.e., are subjective or relative.

The popularity of epistemic relativism is also enhanced by a widespread conviction that traditional, foundationalist theories of knowledge are bankrupt. But relativists often run together, under the rubric "foundationalism," the general thesis that there are objective standards of evidential quality, and a specific account of those standards; and thus take for granted that the failure of that account undermines the objectivity of epistemic standards. And though it's true that the structure of evidence isn't, as foundationalists suppose, linear and one-dimensional, it doesn't follow that standards of evidence are relative to context, etc.

Then there's Kuhn's observation that proponents of rival scientific paradigms disagree even about what constitutes evidence. This, too, is true; but the conclusion that evidential standards are not objective but relative still doesn't follow. Proponents of rival scientific paradigms are much like you and me on that hiring committee; it is the deep-seated disagreement in their background beliefs, like our minor disagreement about graphology, that gives rise to their divergent judgments of what evidence is relevant.

Many proponents of the Higher Dismissiveness, rather than sticking consistently to a relativist stance, shift between relativism and tribalism, between denying that it makes sense to think of epistemic standards as objectively better or worse, and claiming that *their* (non-white, non-Western, non-masculinist, non-scientific, or whatever) epistemic standards are better. Usually, shielded by this strategic ambiguity, they dodge charges of self-defeating relativism while evading the necessity to say why their standards are better. But occasionally you hear it suggested that non-white, non-Western, etc., standards are better because they are non-linear. The structure of evidence is, indeed, non-linear; but what has this to do with race, gender, and all that?—nothing.

Let me be brisk; I am running out of space, and you are probably running out of patience with non sequiturs. There is no uniquely rational method exclusive to the sciences that guarantees that, as they proceed, they will arrive at true, or probably true, or more nearly true, or more empirically adequate, results; it doesn't follow that the natural sciences haven't had remarkable successes, or that they are in no way epistemically distinguished. Science, like literature, requires imagination, and scientists, like writers of literature, use metaphors and push at the limits of the language they inherit; it doesn't follow that science is just a form of fiction. Scientific inquiry is a deeply and essentially social enterprise, and its internal organization and external environment can affect how well or poorly it is conducted; it doesn't follow that there is nothing more to scientific inquiry than a process of social negotiation in which scientists trade their theoretical loyalties for prestige, nor that the entities referred to in scientific theories are mere social constructions. Some of the knowledge the natural sciences have achieved has the potential to cause grave harm—knowledge brings power, and power can be abused; but it doesn't follow that the natural sciences haven't achieved bona fide knowledge.

As radical feminists and multiculturalists have jumped on the bandwagon of the Higher Dismissiveness, the bizarre idea has come to be taken for granted that to suppose that there is such a thing as truth, that it is possible to discover the truth by investigation, or that the natural sciences have made many true discoveries, must be to harbor regressive political tendencies. And so the sexist stereotypes deplored by old-fashioned feminists have come to be celebrated as "women's ways of knowing," and the admirable goal of tolerance of cultural diversity has been transmuted into relativism or tribalism. This is very sad.

Yes, excessive confidence that what you take to be true, is true—the "blight of cocksureness"[9] —can be a tool of oppression. But reason, truth, evidence, are our best defense against racist and sexist stereotypes. And well-conducted inquiry—the fallible, untidy, ragged process of groping for, and sometimes grasping, something of how the world is—most certainly isn't a white male thing; *it's a human thing.*

Notes

1. *Collected Papers,* eds Charles Hartshorne, Paul Weiss, and Arthur Burks, Harvard University Press, Cambridge, MA, 1931–58, 1.14.

2. See Richard Rorty, *Essays on Heidegger and Others,* Cambridge University Press, Cambridge, 1991, p.86 (we are "old-fashioned prigs"); Stephen P. Stich, *The Fragmentation of Reason,* Bradford Books, MIT Press, 1992, p.101 (we don't have "a clear view of the matter").

3. The phrase is due to Anthony Gottlieb, from a review of Rorty.

4. Adam Rogers, "Come in Mars," *Newsweek,* August 19, 1996, 56–58; Sharon Begley and Adam Rogers, "War of the Worlds," *Newsweek,* February 10, 1997, 56–58.

5. See Susan Haack, *Evidence and Inquiry: Towards Reconstruction in Epistemology,* Blackwell, Oxford, 1993, especially chapter 4.

6. Wendy Bounds, "One Family's Search for a Faulty Gene," *Wall Street Journal,* August 15, 1996, B1, B7.

7. Richard Rorty, *Consequences of Pragmatism,* Harvester, Hassocks, Sussex, 1982, xviii.

8. On the use of scare quotes to neutralize success-words, the classic treatment is David Stove, *Popper and After: Four Irrationalists* (Pergamon, Oxford, 1981), reissued under the title *Anything Goes: Origins of the Cult of Scientific Irrationalism,* by MacLeay Press, Paddington, Australia, 1998, chapter 1.

9. Peirce again, from *Collected Papers,* 1.13: "no blight can so surely arrest all intellectual growth than the blight of cocksureness." □

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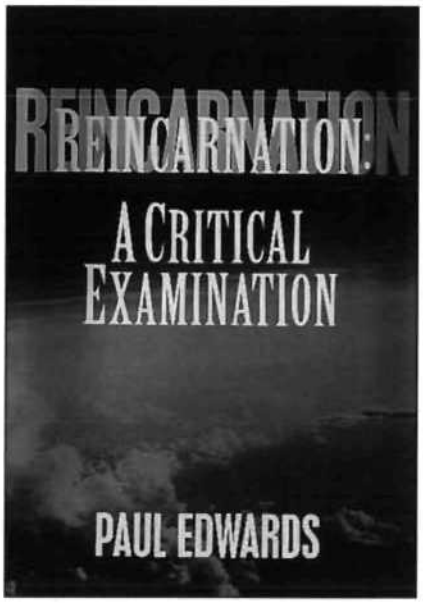
A Cogent Consideration of the Case for Karma (and Reincarnation)

BY BARRY L. BEYERSTEIN

Reincarnation: A Critical Examination. By Paul Edwards. Prometheus Books, 1996. ISBN 1-57392-005-3. 313 pp. Hardcover, $31.95

Few of us enjoy having the frailties of our most comforting beliefs revealed, and when the assumptions under scrutiny concern "big ticket" items such as the possibility of an afterlife or the supernatural underpinnings of our moral precepts, a questioning attitude is almost guaranteed to make the bearer about as popular as the proverbial skunk at the garden party. Paul Edwards has risked this fate once again, this time by critically examining certain doctrines, once confined largely to Hindu and Buddhist believers, that have recently gained popularity among the eclectic disciples of New Age spirituality. Interestingly, they have also attracted more than a few Christian adherents who cheerfully overlook the fact that the doctrine of reincarnation contradicts other core tenets of their faith.

Heretofore largely ignored by Western philosophers of any stature, the traditionally associated (but logically independent) doctrines of reincarnation and Karma are thoroughly examined in Paul Edwards' enjoyable and encyclopedic treatise. Edwards proceeds with his usual precision to expose the hidden assumptions, the empirical flaws, and the often unpalatable implications of these teachings that, on the surface, can seem quite appealing. It is always a pleasure to watch an incisive thinker cut right to the heart of an issue and then proceed to lay out its logical consequents in clear and concise prose. It is a double treat if that exposition is accomplished with wit and flair, as is the case here. One all too rarely gets the bonus of chuckling through a detailed and cogent analysis by an eminent philosopher. Take for instance this example of the twinkle in the scholar's eye that appears on page 18: "It seems ludicrous that something as important as creation of a soul that is going to exist forever should be tied to such accidents as the failure of a birth-control appliance."



The belief that some essence of ourselves survives bodily death is perhaps the most comforting of all spiritual leanings. It has provided reassurance for human beings probably since our ancestors first evolved brains of sufficient complexity to anticipate the future and contemplate their own mortality. The solace provided by any sort of expectation of an afterlife would probably have been sufficient to assure its undiminished popularity all by itself, but, as Edwards points out, the version of immortality preached by most reincarnationists offers yet another enticement. Belief in reincarnation feeds not only the hope for life beyond the grave, but in conjunction with its frequent fellow traveler, the "law" of Karma, it also provides apparent support for another widespread human longing, the desire to believe that we inhabit a just universe.

The warm glow this solution provides for believers diverts their attention from the many inherent conceptual and practical difficulties that Edwards lays bare in this book. For instance, a major difficulty for reincarnationists is what he calls the "modus operandi" problem. For magical thinkers, just imagining something can bring it about. But for the rest of us, there is the inconvenient need for a plausible chain of causal mechanisms before we can grant the likelihood of any given phenomenon. With the many advances in scientific understanding since the formulative days of the reincarnation story, it has become increasingly difficult even to conceive of a reasonable mechanism whereby a bodily attribute

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(such as a birthmark or deformity, which are afforded much attention in reincarnationist circles) or a mental property such as knowledge, a personality trait, or an inclination, could be packaged up at the end of one person's lifetime, held in abeyance in non-physical form between incarnations (the "interregnum problem") and finally implanted in a fetus in its mother's womb in preparation for another revolution of the eternal carousel. It likewise strains credulity to accept the requirement that detailed tallies of every good and bad deed committed by every person who ever lived could be kept somewhere and weighed, let alone harnessed to transgenerational retributive mechanisms as diverse as earthquakes, bacteria, raging bulls, lightning bolts, or a large, ill-tempered bar patron named Bob.

The Canadian psychologist Melvin Lerner and his colleagues have studied various psychological needs that make the idea of transcendental fairness enforcers such as Karma perennially attractive. Lerner describes a number of payoffs for believing in what he calls the "just world hypothesis," i.e., the soothing notion that, in life, people generally get what they deserve and deserve what they get. Many of us rebel emotionally at the realization—easily prompted by a quick glance at the daily headlines—that the plums and brickbats of life seem to be somewhat randomly apportioned, morally speaking. Apparently, it is too threatening for a large portion of the populace to admit that, no matter how long and hard one has tried to do the right thing, the driver of that approaching bus could still be just about to doze off. It is this motivation to salvage belief in a hidden hand that metes out *deserved* rewards and punishments on a cosmic scale that explains the unsavory but widely observed tendency to derogate apparently innocent victims. For example, "She must have dressed or behaved provocatively or she wouldn't have been raped, would she?"

With adult victims of misfortune, it is often sufficient merely to distort our perception of the worthiness of the individual to preserve our belief in a just world, but what of infants afflicted with excruciating and disfiguring diseases, or children orphaned and tortured by the perpetrators of "ethnic cleansing"? How could they possibly have accumulated enough demerits in their short lives to have deserved such a cruel fate? A ready answer, if you can accept it, is supplied by those two objects of Edwards' dissecting scalpel, reincarnation and Karma. Apparently, you can take it—accumulated *moral* capital, anyway—with you, after all. Herein we have the long-sought excuse for the panorama of gratuitous evil and unearned windfalls we encounter daily. Those kids deserved it all right, but not for what they did in this brief but brutal existence. Rather, they are expiating vicious acts in one or more of an infinite series of previous lives. And, incidentally, that Wall Street junk bond dealer does deserve his Rolex, BMW, and yacht after all—he was obviously a somewhat more meritorious character in a previous incarnation.

Neat, huh? Well, yes, sort of and even Edwards admits that this account makes more sense than the traditional Christian explanation that napalmed babies are, for reasons beyond our feeble ken, an unfortunate by-product of Adam and Eve's predilection for apples. But wait! As is so often the case, the large print giveth, but the small print taketh away. The small print, deftly enlarged by Edwards, reveals that the doctrines of Karma and reincarnation, so conducive at first glance, carry with them some truly revolting implications, ones their devotees seem rarely to have noticed. For instance, it follows from these views that I ought not to give a donation for African famine relief because those starving wretches must deserve that fate for having blotted their copybooks last time (or times) around. Helping the afflicted just thwarts their Karma, you see.

Another stumbling block raised by Edwards is the steadily climbing world population. If the souls of every one of today's earthlings necessarily inhabited a body in a previous generation, and—also according to doctrine—no new souls are being created, and there were fewer bodies on the planet then than now, we would seem to be faced with a serious soul deficit. A few reincarnationists have attempted to sidestep this impediment with mind-numbing *ad hoc* gyrations (upgrading of animal souls, recruiting souls from other planets or dimensions, soul sharing, etc.), but the extremes to which these apologists have gone only underscores, as Edwards notes, how fanciful the whole reincarnationist enterprise really is.

Then we come to perhaps the weightiest, and for me (as a long-time student of brain function), the most engaging objection to reincarnation raised by Edwards. A compelling reason to doubt that a packet of personality traits and abilities could leap from a dying person, into limbo, and thenceforth to a newly conceived embryo, is the evident linkage of all psychological attributes to highly specific structures and functions in *individual* brains. While modern neuroscience cannot conclusively rule out the possibility that disembodied consciousness could exist, the staggering amount of evidence suggesting that thinking, remembering, and feeling require an intact, functioning brain serves to make the brain-mind link one of the most well-supported postulates to be found anywhere in science. I have presented an overview of that evidence and its implications for a number of occult beliefs, including reincarnation, in a previous issue of this journal (SI, Winter 1988).

While Edwards does not advocate, as I did on that occasion, the most extreme version of the materialist position on the "mind-body problem"—the psychoneural identity hypothesis, which asserts that mental functions are *identical* with states of the brain—he argues that the manifest *dependence* of all mental functions on specific brain functions makes the possibility that personal traits, knowledge, or self-awareness could skip from one incarnation to the next exceed-

ingly remote. Either way, as I noted in the above-mentioned article, if this kind of transmigration of traits and knowledge is possible, my entire chosen field of behavioral neuroscience is essentially a fool's errand. Fortunately, after reading this book, the prudent bettor will probably conclude that the chances of the concept of reincarnation being fatally flawed are substantially greater than the probability that the fundamental tenet of neuroscience (i.e., brain-mind linkage, which, if true, makes reincarnation so improbable) is in substantial danger.

The evidence, such as it is, is exhaustively examined by Edwards. Much of it comes from seemingly credible witnesses who claim to have seen the projected "astral bodies" of others at the time of the latter's death, or from children who seem remarkably precocious, or who "remember" people, places or events that they seem unlikely to have known about if they had not actually experienced them in a previous life. Edwards shows that the empirical evidence, like the supporting arguments put forth by past-life explorers such as Elizabeth Kübler-Ross, Stanislav Grof, Raymond Moody, and Ian Stevenson are far less compelling than the tabloid headlines would have you believe. As with most anecdotal evidence of this sort, examination reveals that tales retold by the faithful have a way of becoming tidier and more convincing as they pass from mouth to mouth.

As Leonard Angel showed in these pages some time ago (SI, Fall 1994), careful reading of the acknowledged "best cases" for reincarnation, e.g., several from the parapsychologist Ian Stevenson, reveals significant internal inconsistencies in the accounts that throw them into doubt, even before the evidence itself is examined. Edwards notes similar problems in the evidential base and has taken the trouble to trace many other "best" cases back as close to their sources as possible. Along the way, we are treated to some hilarious examples of gullibility among those seized by the will to believe. In attacking the famous "Bridey Murphy" case, supposedly one of the strongest in the reincarnationists' arsenal, Edwards does skeptics the additional service of pointing out that some of the rebuttals that skeptics like to tout (myself among them, until I read this chapter) were themselves the products of journalistic excess and thus not to be relied upon. Edwards finds much else, however, to discredit the evidence for Virginia Tighe's prior existence as Bridey Murphy. In the process, he supplies trenchant critiques of the use of hypnosis and related techniques to "reveal" memories of past lives. Suffice it to say that, overall, the empirical case for reincarnation fares no better than the conceptual, logical, and moral ones.

Skeptics who follow my recommendation and read *Reincarnation: A Critical Examination* will derive much ammunition for arguing not only with reincarnationists but with "near-death experience" afficionados and afterlife enthusiasts of other stripes as well. They will be treated to a good read in the process—H. L. Mencken's essays spring immediately to mind in this regard. *Reincarnation* is a useful adjunct to Edwards' earlier edited volume, *Immortality* (Macmillan, 1992) and to another work that both he and I admire, Susan Blackmore's *Dying to Live* (Prometheus, 1993). Skeptics familiar with these works will enter debates well prepared. They should be warned, however, that if the logic and evidence contained therein were the final determinants of belief, fuzzy but comforting notions like reincarnation and Karma would never have gained their substantial cultural toehold in the first place.

Incredible Stories: Fortean Mystery Mongering

JOE NICKELL

The World's Most Incredible Stories: The Best of Fortean Times. Selected and edited by Adam Sisman. Barnes and Noble, New York, 1998. ISBN 0-7607-0893-2. 192 pp. Hardcover, £20.

Mystery mongering sells. Why else would Barnes and Noble issue a 1998 edition of *The World's Most Incredible Stories: The Best of Fortean Times*? The book's title is quite correct; many of the stories therein are in fact incredible, as in "not credible," which is what we have come to expect from *Fortean Times* magazine. Originally published in London in 1992, the collection of oddities, anomalies, and occult claims is (as its subtitle indicates) in the tradition of Charles Fort. Fort (1874–1932) loved to challenge "orthodox" scientists with things they supposedly could not explain, like rains of fish or frogs.

In the introduction to *Incredible Stories,* Lyall Watson paints a typically Fortean, typically disparaging view of science: an endeavor that "claims to be objective" but is "inherently conservative and resistant to change," even a fundamentally "political process" that "depends on personal preference, upon the votes of a scientific jury—every member of which would be disqualified from any normal inquiry on the basis of blatant conflict of interest."

To Watson what is needed is "a truly impartial investigator—a sort of scientific ombudsman—to provide the voice of reason, to speak out for curious individuals against the vested interests of those in authority." Fort fits the bill, says Watson, who seems to speak for Forteans everywhere when he states, ". . . I know that there is a vast field of unusual experience from all over the world, just waiting to be examined. The problem is that reports of it are, by their very nature,

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anecdotal, and therefore dismissed as unacceptable to science."

In fact, however, Charles Fort did not actually investigate reported occurrences. Having come into an inheritance that permitted him to sit comfortably and indulge his hobby, he spent his last twenty-six years scouring old periodicals for reports of mysterious occurrences, giving the distinct impression that he believed whatever was asserted was true—or at least suitable for taunting members of the scientific "priestcraft." Thus Fort is the poster boy for the limits of anecdotal evidence, and his armchair mystery-mongering attitude is continued by Adam Sisman who selected and edited the present collection of tales.

Some items in the collection are non-mysteries, like a runaway wallaby, and others are merely Ripleyesque: a six-legged lamb (10), identical twins who gave birth on the same day (20), and a stationers shop named Reid & Wright (22). There is even some genuine skepticism, such as with the reports of "wolf children" who are acknowledged as probably mentally and physically handicapped (102). A token handful of hoaxes and urban legends—that is, ones actually recognized as such—are also included (188–191).

But numerous alleged paranormal mysteries touted in the book are bogus. For example, the front cover portrays "Psychic Katie," with copper foil apparently having materialized on her body. Yet this, along with one of Katie's other feats—producing glass gems from her eye—was easily duplicated by CSICOP investigators for an October 1990 episode of the *Unsolved Mysteries* television program. (Slow-motion study of the gem feat showed the object was apparently hidden between her fingers. See SKEPTICAL INQUIRER, May/June 1997, 16–17.)

Regarding Atlanta's 1987 "House of Blood" mystery, the Fortean book relates how the elderly residents had described blood springing from the floor "like a sprinkler" and claims that it had appeared "in narrow spaces virtually impossible for a person to reach" (93). In fact, a SKEPTICAL INQUIRER article of Spring 1989 quoted a police detective as suggesting the affair was a hoax, and a subsequent 1994 investigation provided corroborative evidence. Expert blood-pattern analysis of police photographs revealed that the blood had been squirted *onto* surfaces rather than having spurted *from* them as the residents had asserted. (See Joe Nickell, *Entities,* Amherst, N.Y.: Prometheus Books, 1995, 92–97.)

In describing "The Aerial Fakir," the book boasts that Subbayah Pullavar once levitated and "remained horizontal in the air for about four minutes." An accompanying photograph documents the feat (166–167). Unfortunately, in stage magician's parlance the effect was not an apparent *levitation* but only a *suspension,* since one hand rested on a rod wrapped in cloth. The secret of such suspensions—consistent with the details of Pullavar's performance—is illustrated in conjuring texts (like Walter Gibson's *Secrets of Magic,* New York: Grosset & Dunlap, 1967, 81–83). (For another "levitation" stunt, see SKEPTICAL INQUIRER, Fall/Winter 1977, 7–9.)

In a section called "Psychic Powers," readers are told that "after cutlery-bending Yuri [sic] Geller's first British broadcast on 23 November 1973, children began to discover their own paranormal powers." They could bend metal objects like nails and keys, and perform other feats, "seemingly just by thinking hard" (170). A photo in physicist John Taylor's 1975 book *Superminds* showed a seven-year-old boy's supposed psychokinetically bent fork and spoon. Alas, as reported by Martin Gardner in the Winter 1979–80 SKEPTICAL INQUIRER, the little psychokinetic marvels were actually exhibiting "kindergarten principles of deception." Observed secretly, the children simply bent the metal in the usual way. A boy used both hands to bend a spoon, while a little girl placed the end of a rod under her foot.

Under "Poltergeists" the Forteans include the 1984 case of Tina Resch, the Columbus, Ohio, fourteen-year-old who seemed startled by airborne telephone receivers and other flying objects (77). Yet although reporters and parapsychologists were duped, some photographs and television news footage captured Tina in the act of toppling a lamp and producing other effects, while a television technician saw her surreptitiously move a table with her foot. Investigator James Randi characterized her at the time as a disturbed teenager. A decade later Tina Resch Boyer would be sentenced to life imprisonment for the murder of her three-year-old daughter. (SKEPTICAL INQUIRER, Spring 1985, 221–235; March/April 1995, 3.)

The mysteriously swirled patterns in southwest English grain fields known as crop circles are discussed from various perspectives, but the evidence for hoaxing gets short shrift: "Numerous attempts by crusading skeptics and newspapermen," states the book, "have failed abysmally to mimic the crop circle phenomenon, which is widely perceived as a hoax." The book concludes: "If it *is* some kind of practical joke, then the organization behind it outstrips the Mafia, KGB and Illuminati combined" (110). Actually, in 1991 "two jovial con men in their sixties" admitted they had launched and nurtured the hoax and been followed by many others in a bandwagon or copycat effect. The hoaxers quickly fooled circle "experts" who declared bogus patterns authentic. (Joe Nickell and John F. Fischer, "The Crop-circle Phenomenon: An Investigative Report," SKEPTICAL INQUIRER, Winter 1992, 136–149.)

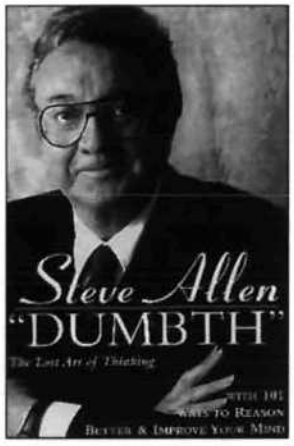
As these examples show, many of the claims in *Incredible Stories* do not withstand scrutiny. In addition, numerous tales lack specific names, places, dates, or source citations that might make further investigation possible. Such accounts also lack credibility as do several that rely on absurd tabloid sources like *Weekly World News.*

And then there are the outrageous assertions, like the unqualified statement that in 1951 Mary Reeser of St. Petersburg, Florida, "spontaneously combusted." Noting "evidence of the extraordinarily fierce heat, inexplicably

contained," the book offers a dubious suggestion that there might have been a connection with "an intense geomagnetic storm" (57). But as the Forteans could have learned from the Summer 1987 SKEPTICAL INQUIRER, Mrs. Reeser's death was not so mysterious. She was last seen smoking a cigarette after having taken sleeping pills, and thus hers was an accident waiting to happen. The large stuffed chair she sat in and her own considerable body fat obviously contributed to the destruction, and the fact that the floor and walls of her efficiency apartment were made of concrete doubtless limited the fire's spread. By leaving out such details, *Incredible Stories* shows the bias it accuses scientists of and undermines Fortean arguments against the scientific method.

The Forteans must know that it takes little effort to launch an incredible claim while serious, prolonged investigation may be required to get to the bottom of a mystery. While there are legitimate enigmas and they should not be dismissed out of hand, Forteans have a responsibility not to make frivolous claims. Like the boy who cried wolf, they may find themselves without credibility. ☐

NEW BOOKS



Dumbth: The Lost Art of Thinking. **Steve Allen.** Prometheus Books, 59 John Glenn Drive, Amherst, NY 14228-2197. 1998. ISBN 1-57392-237-4. 445 pp. Paperback, $18.95. A welcome new edition of this passionate attack on unreason and guide to life-long learning and thinking by the creative author, entertainer, polymath, and CSICOP Fellow. Originally written "out of what had become literally daily frustration with the degree of goofola thinking, speech, and behavior that had become so dominant," Allen says the demand for a freshened-up edition is "a testimonial to the ever-growing seriousness of the problem it addresses." About half of the book consists of his 101 "Ways to Think Better," with thoughtful discussions of each. (No. 1: "Decide that in the future you will reason more effectively." No. 8: "Recognize that you have personal prejudices." No. 22: "Know that reason need not be the enemy of emotion." No. 58: "Familiarize yourself with the commonly accepted scientific view of the universe." No. 68: "Understand the difference between fact and opinion." No. 93: "Get in the habit of using an encyclopedia." No. 99: "Be humble when consulting with memory.")

Manifesto of a Passionate Moderate. **Susan Haack.** The University of Chicago Press, 5801 South Ellis Avenue, Chicago, IL 60637. 1998. ISBN 0-226-31136-8. 212 pp. Paperback, $22.50. Relativism, multiculturalism, feminism, affirmative action, pragmatisms old and new, science, literature, the future of the academy and of philosophy itself all come under Haack's scrutiny. A chapter based on this new work by philosopher and CSICOP Fellow Haack appears in this issue on page 47.

Taking Darwin Seriously. **Michael Ruse.** Prometheus Books, 59 John Glenn Drive, Amherst N.Y. 14228-2197. 1998. ISBN 1-57392-242-0. 232 pp. Paperback, $18.95. The original edition of this book, written by a University of Guelph professor of philosophy and zoology, established a naturalistic approach to our understanding of life's major problems through the application of evolutionary biology. This new edition updates the original with a new preface and a final chapter that addresses the most recent developments in and popular attacks on contemporary evolution. Intended as a direct challenge to all who would push creationism as a credible alternative to scientific evolution.

Editor's Choice Science Books:

This New Ocean: The Story of the First Space Age. **William E. Burrows.** Random House, Inc., New York. 1998. ISBN 0-679-44521-8. 723 pp. Hardcover, $34.95.

What Remains To Be Discovered: Mapping the Secrets of the Universe, the Origins of Life, and the Future of the Human Race. **John Maddox.** Free Press/Simon & Schuster, New York. 1998. ISBN 0-684-82292-X. 434 pp. Hardcover, $26.

—Kendrick Frazier

PSYCHIC VIBRATIONS *from page 19*

course, struck Bell's already-paranoid audience like a bolt of lightning. Immediately rumors began circulating that Bell, who lives in Pahrump, Nevada, not far from the top-secret Area 51, had been silenced by sinister forces to keep him from revealing any more secrets about "earth-changes," UFOs, or something even more dreadful. Nye County Sheriff Wade Lieseke Jr., worried that Bell might be in danger, stopped by Bell's home soon after the announcement and reported that the radio celebrity was "fine" and "not in danger." As for what the "terrible event" might be, Sheriff Nye said he was not at liberty to disclose it.

One account said that a being named "Single Seven" who claimed to be a time traveller from the year 2063 (who earlier had been interviewed on Art's show) had intervened with Bell to attempt to avert a catastrophe that otherwise would have struck him. The story gained widespread credence until Bell himself came out of seclusion to deny it.

Just two weeks later on October 28, Bell returned to the airwaves, explaining little beyond that "the situation has improved to some degree," and that "my network stepped in and helped me." And now the nonstop blather about aliens, conspiracies, and imminent catastrophes continues six nights a week, to audiences larger than ever. ☐

Acocella, Joan. "The Politics of Hysteria." *The New Yorker,* April 6, 1998, pp. 64–79. Over the past twenty years, multiple-personality disorder has been used to explain the behavior of thousands of American women. How was it allowed to happen? This article is a penetrating examination of the dynamics of claims about multiple personality disorder. Shows how the rise of neurology, the fad for spiritualism, and the cult of the irrational all contributed, along with the campaign for women's rights and the child-protection movement of the 1970s, to the recovered-memory movement. Both that movement and multiple-personality disorder were enthusiastically supported by the media. "It was less a conspiracy theory than a reflex of our current politics."

Baker, Robert A., "A View of Hypnosis." *The Harvard Mental Health Letter,* Feb. 1998, pp. 5–6. A clear, brief discussion of what hypnosis is and is not. Says Baker: "The concepts of hypnotic trance, somnambulism, and dissociation are unnecessary: no unusual state of consciousness is involved."

Bardeen, Marjorie G., and Leon M. Lederman. "Coherence in Science Education." *Science,* 281: 178–179, July 10, 1998. Policy Forum essay calls for a three-year, coherent, integrated science sequence following a more natural hierarchy than is taught now in almost all schools. Based on a realization that chemistry is really a prerequisite for biology and physics a prerequisite for chemistry, the authors propose a coherent sequence: Science I (focused on physics), Science II (focused on chemistry), and Science III (focused on biology). Teaching the process of science (including "the crucial role of skepticism") would be integrated into the curriculum, as would some experience of real-world interdisciplinary problems.

Cohen, Hal. "God Only Knows." *Lingua Franca.* 8 (5): 59–62, July/August 1998. A skeptical look at the Bible codes from the viewpoint of mathematicians who have been reluctant to debate what one called "such puerile stupidities."

Daghler, Zoubeida, R. and Saouma BouJaoude. "Scientific Views and Religious Beliefs of College Students: The Case of Biological Evolution." *Journal of Research in Science Teaching,* 34 (5): 429–445, May 1997. A class of Lebanese biology students (mostly Christian and Muslim) were polled on their views on evolution and religion. They showed various systems for dealing with the apparent contradictions between their faith and science. The authors argue that teaching biology as a method of inquiry and addressing the difficulties religious students may face would help the students embrace the material.

Gardner, Martin. "A Quarter-Century of Recreational Mathematics." *Scientific American,* August 1998, pp. 68–75. The author of Scientific American's column "Mathematical Games" from 1956 to 1981 (and SI's "Notes of a Fringe-Watcher" from 1983 to present) recounts twenty-five years of amusing puzzles and serious discoveries. Gardner fans will love this look back on his column, which delighted, entertained, and educated so many people.

Garven, Sena, et al. "More than Suggestion: The Effect of Interviewing Techniques From the McMartin Preschool Cast." *Journal of Applied Psychology.* 83 (3): 347–359, June 1998. Several articles have pointed out poor interviewing techniques in the investigation of alleged sexual abuse at McMartin Preschool. Garven and associates demonstrate that these techniques (suggestive questions, telling what other people have said, positive and negative reinforcements, asked-and-answered, and inviting speculation) increased false accusations in preschoolers by 70 percent compared to simply asking suggestive questions.

Gierlowski-Kordesch, Elizabeth. "Discovered: Sodom and Gomorrah! A video (reviewed)." *Biblical Archeological Review.* 24 (5): 60–62, September/October 1998. The editors of BAR, which is not a religious magazine, explain that readers often ask about the reliability of Ron Wyatt, who claims to have discovered Noah's Ark, the Ark of the Covenant, etc. They invited Gierlowski-Kordesch, a geologist, to review Wyatt's 1992 video about Sodom and Gomorrah. She begins by listing the warning signs of junk science and goes on to give natural explanations for Wyatt's supernatural claims.

Hayward, James. "The Clonmel 'Fairy' Murder (1895)." *The Criminologist.* 21 (4): 231–239, Winter 1997. In nineteenth-century Ireland a group of people killed a woman in an attempt to force out the fairy they believed had replaced her. This is similar to the exorcism deaths that occur occasionally today.

Hayward, James. "Ritual Abuse: Trial and Error." *The Criminologist.* 21 (1) 3–25, Spring 1997. Hayward reviews all alleged cases of ritual child abuse in Britain during the eighties, including cases in which social workers made dawn raids, taking children away from their parents for months at a time. He quotes a government report that found no cases of Satanic abuse (with a religious objective), but three cases of ritual abuse (in which pseudo-occult practices were used to attract or threaten victims).

Hilpern, Kate. "A Question of Faith." *(London) Times Magazine.* April 25, 1998. pp. 86–88. There are 20,000 spiritual healers at work in Britain. The article discusses Lynn Rose and two of her clients, one of whom found relief from multiple sclerosis symptoms, while the other found none for back problems.

Levy, David H. "How to Make Sense Out of Science." *Parade Magazine,* Sept. 20, 1998, p. 10. The noted astronomy writer (and co-discoverer of the famous Jupiter-impacting Comet Shoemaker-Levy 9) David Levy offers ways to improve your understanding of often-times confusing announcements of breakthroughs or discoveries that you later hear were inaccurate or wrong. "Science is too important, too interesting, and too much fun not to be communicated accurately, without misleading exaggeration in a way that we can all understand."

Lilienfeld, Scott O., and Elizabeth F. Loftus. "Repressed Memories and World War II. Some Cautionary Notes." *Professional Psychology: Research and Practice,* 1998. 29(5): 471–475. A 1997 article by B.P. Karon and A.J. Widner argued that clinical data derived from WWII veterans provide unambiguous evidence for the existence of repressed and recovered memories. Lilienfeld and Loftus respond that research evidence for the existence of repression is much weaker than asserted by Karon and Widner, the use of hypnosis and sodium pentathol to recover memories is problematic, and the case study presented is difficult to interpret. They conclude, "Although further examination of case reports from WWII veterans is clearly warranted, it would be premature to conclude that these reports confirm the existence of repressed and recovered memories."

MacKenzie, Debora. "A Cure for Quacks." *New Scientist,* Aug. 22, 1998, pp. 18–19. Good report on the case in southern Italy in which a judge decreed that the country's health service must pay for cancer

patients to take an expensive untested remedy—unanimously rejected by scientists—promoted by a retired physiologist. Subsequent government-sponsored trials in July showed that none of the 134 patients improved in two months of treatment. Half sustained serious side effects, and three-quarters became more ill and died. Public support has since fallen and the hysteria has fallen off a bit.

Magida, Arthur J. "The Aish Phenomenon: Targeting Skeptics." *Moment.* 23 (3): 52–57, 72–72, 78–82. A report on Aish Ha Torah's Discovery Seminars, which rely heavily on "Bible Codes." More than 25,000 Jews, including Kirk Douglas and Steven Spielberg, have attended these sessions that encourage knowledgeable Judaism (according to the sponsors) or promote Orthodox Judaism (according to detractors).

Moore, Randy. "Creationism in the United States 1. Banning Evolution From the Classroom." *American Biology Teacher* 60 (7): 486–506, September 1998. First of a series of articles by a University of Louisville biology professor presenting a legal-history of the evolution/creationism controversy, highlighting the issues involved in this clash of two powerful constituencies. This article focuses on the Scopes trial, which has profoundly influenced the legislation, court decisions, and local actions involving the creation/evolution controversy during the past seventy-five years.

Moyer, Albert. "Simon Newcomb: Astronomer with an Attitude." *Scientific American,* October 1998, pp. 88–93. The celebrated late-nineteenth century American astronomer Simon Newcomb was an early popular advocate of science and also pushed for broad social and cultural reforms based on the use of scientific method. He called for differentiating scientific knowledge from religious belief. Although skeptical of ESP, mental telepathy, and other alleged paranormal phenomena, Newcomb felt that scientists should at least review the evidence for the purported effects and, as a result, at William James's behest became in the mid-1880s the first president of the newly formed American Society for Psychical Research. His objective was to sort out what, if anything, was scientifically defensible from what must be debunked as dangerous fraud. He threw himself into the research, and what he found hardened his skepticism. Through his final years he was convinced, and hoped to convince others, that on methodological grounds, psychical research was a scientific dead end.

Oritz de Montellano, Bernard, et al. "They Were NOT Here Before Columbus: Afrocentric Hyperdifussionism in the 1990s." *Ethnohistory.* 44 (2): 199–234, Spring 1997. A detailed critique of Afrocentric arguments that Black Egyptians influenced or created pre-European culture in South America. A nine-page bibliography captures sources on both sides.

Owen, C., C. Tarantello, J. Jones, and C. Tennant. "Lunar Cycles and Violent Behavior." *Australian and New Zealand Journal of Psychiatry,* 1998, 32(4): 496–499. Study shows that, contrary to hospital personnel's impressions, the lunar cycle has no influence at all on the incidence of violent crimes.

Wolper, Joanna. "She Quits Job Over Aliens, Elvis, and Love Nest Stories." *Editor and Publisher.* April 18, 1998. pp. 66–68. Award-winning reporter Terry Raskyn spent three years as the "Journalism Spin Doctor" for the *Globe* tabloid newspaper. She quit over the paper's coverage of Princess Diana's death.

—Kendrick Frazier and Robert Lopresti

SCIENCE BEST SELLERS

Top Ten Best Sellers in **San Francisco**

1 ***Consilience***
Edward Wilson; Knopf

2 ***The Man Who Loved Only Numbers***
Paul Hoffman; Fourth Estate

3 ***Guns, Germs and Steel***
Jared Diamond; W. W. Norton

4 ***Cosmic Serpent***
Jeremy Narby; J. P. Tarcher

5 ***Machine Beauty***
David Gelernter; Basic Books

6 ***Fermat's Enigma***
Simon Singh; Anchor

7 ***How the Mind Works***
Steven Pinker; W. W. Norton

8 ***Cats' Paws & Catapults***
Steven Vogel; W. W. Norton

9 ***Skeptics & True Believers***
Chet Raymo; Walker

10 ***Life by the Numbers***
Keith Devlin; John Wiley

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Alternative Medicine

The Risks of Untested and Unregulated Remedies

MARCIA ANGELL, M.D. AND JEROME P. KASSIRER, M.D.

What is there about alternative medicine that sets it apart from ordinary medicine? The term refers to a remarkably heterogeneous group of theories and practices—as disparate as homeopathy, therapeutic touch, imagery, and herbal medicine. What unites them? Eisenberg et al. defined alternative medicine (now often called complementary medicine) as "medical interventions not taught widely at U.S. medical schools or generally available at U.S. hospitals." (1) That is not a very satisfactory definition, especially since many alternative remedies have recently found their way into the medical mainstream. Medical schools teach alternative medicine, hospitals and health maintenance organizations offer it, (2) and laws in some states require health plans to cover it. (3) It also constitutes a huge and rapidly growing industry, in which major pharmaceutical companies are now participating. (4)

What most sets alternative medicine apart, in our view, is that it has not been scientifically tested and its advocates largely deny the need for such testing. By testing, we mean the marshaling of rigorous evidence of safety and efficacy, as required by the Food and Drug Administration (FDA) for the approval of drugs and by the best peer-reviewed medical journals for the publication of research reports. Of course, many treatments used in conventional medicine have not been rigorously tested, either, but the scientific community generally acknowledges that this is a failing that needs to be remedied. Many advocates of alternative medicine, in contrast, believe the scientific method is simply not applicable to their remedies. They rely instead on anecdotes and theories.

In 1992, Congress established within the National Institutes of Health an Office of Alternative Medicine to evaluate alternative remedies. So far, the results have been disappointing. For example, of the 30 research grants the office awarded in 1993, 28 have resulted in "final reports" (abstracts) that are listed in the office's public on-line data base. (5) But a Medline search almost six years after the grants were awarded revealed that only 9 of the 28 resulted in published papers. Five were in 2 journals not included among the 3,500 journal titles in the Countway Library of Medicine's collection. (6,7,8,9,10) Of the other four studies, none was a controlled clinical trial that would allow any conclusions to be drawn about the efficacy of an alternative treatment. (11,12,13,14)

It might be argued that conventional medicine relies on anecdotes, too, some of which are published as case reports in peer-reviewed journals. But these case reports differ from the anecdotes of alternative medicine. They describe a well-documented new finding in a defined setting. If, for example, the Journal were to receive a paper describing a patient's recovery from cancer of the pancreas after he had ingested a rhubarb diet, we would require documentation of the disease and its extent, we would ask about other, similar patients who did not recover after eating rhubarb, and we might suggest trying the diet on other patients. If the answers to these and other questions were satisfactory, we might publish a case report—not to announce a remedy, but only to suggest a hypothesis that should be tested in a proper clinical trial. In contrast, anecdotes about alternative remedies (usually published in books and magazines for the public) have no such documentation and are considered sufficient in themselves as support for therapeutic claims.

Alternative medicine also distinguishes itself by an ideology that largely ignores biologic mechanisms, often disparages modern science, and relies on what are purported to be ancient practices and natural remedies (which are seen as somehow being simultaneously

Marcia Angell is executive editor and Jerome P. Kassirer is editor of The New England Journal of Medicine. *This article appeared as an editorial in the* The New England Journal of Medicine *September 17, 1998, Volume 339, Number 12, and is reprinted by permission.* *Copyright © 1998 by the Massachusetts Medical Society. All rights reserved.*

more potent and less toxic than conventional medicine). Accordingly, herbs or mixtures of herbs are considered superior to the active compounds isolated in the laboratory. And healing methods such as homeopathy and therapeutic touch are fervently promoted despite not only the lack of good clinical evidence of effectiveness, but the presence of a rationale that violates fundamental scientific laws—surely a circumstance that requires more, rather than less, evidence.

Of all forms of alternative treatment, the most common is herbal medicine. (15) Until the 20th century, most remedies were botanicals, a few of which were found through trial and error to be helpful. For example, purple foxglove was found to be helpful for dropsy, the opium poppy for pain, cough, and diarrhea, and cinchona bark for fever. But therapeutic successes with botanicals came at great human cost. The indications for using a given botanical were ill defined, dosage was arbitrary because the concentrations of the active ingredient were unknown, and all manner of contaminants were often present. More important, many of the remedies simply did not work, and some were harmful or even deadly. The only way to separate the beneficial from the useless or hazardous was through anecdotes relayed mainly by word of mouth.

All that began to change in the 20th century as a result of rapid advances in medical science. The emergence of sophisticated chemical and pharmacologic methods meant that we could identify and purify the active ingredients in botanicals and study them. Digitalis was extracted from the purple foxglove, morphine from the opium poppy, and quinine from cinchona bark. Furthermore, once the chemistry was understood, it was possible to synthesize related molecules with more desirable properties. For example, penicillin was fortuitously discovered when penicillium mold contaminated some bacterial cultures. Isolating and characterizing it permitted the synthesis of a wide variety of related antibiotics with different spectrums of activity.

In addition, powerful epidemiologic tools were developed for testing potential remedies. In particular, the evolution of the randomized, controlled clinical trial enabled researchers to study with precision the safety, efficacy, and dose effects of proposed treatments and the indications for them. No longer do we have to rely on trial and error and anecdotes. We have learned to ask for and expect statistically reliable evidence before accepting conclusions about remedies. Without such evidence, the FDA will not permit a drug to be marketed.

Many advocates of alternative medicine believe the scientific method is simply not applicable to their remedies. They rely instead on anecdotes and theories.

The results of these advances have been spectacular. As examples, we now know that treatment with aspirin, heparin, thrombolytic agents, and beta-adrenergic blockers greatly reduces mortality from myocardial infarction; a combination of nucleoside analogues and a protease inhibitor can stave off the onset of AIDS in people with human immunodefiency virus infection; antibiotics heal peptic ulcers; and a cocktail of cytotoxic drugs can cure most cases of childhood leukemia. Also in this century, we have developed and tested vaccines against a great many infectious scourges, including measles, poliomyelitis, pertussis, diphtheria, hepatitis B, some forms of meningitis, and pneumococcal pneumonia, and we have a vast arsenal of effective antibiotics for many others. In less than a century, life expectancy in the United States has increased by three decades, in part because of better sanitation and living standards, but in large part because of advances in medicine realized through rigorous testing. Other countries lagged behind, but as scientific medicine became universal, all countries affluent enough to afford it saw the same benefits.

Now, with the increased interest in alternative medicine, we see a reversion to irrational approaches to medical practice, even while scientific medicine is making some of its most dramatic advances. Exploring the reasons for this paradox is outside the scope of this editorial, but it is probably in part a matter of disillusionment with the often hurried and impersonal care delivered by conventional physicians, as well as the harsh treatments that may be necessary for life-threatening diseases.

Fortunately, most untested herbal remedies are probably harmless. In addition, they seem to be used primarily by people who are healthy and believe the remedies will help them stay that way, or by people who have common, relatively minor problems, such as backache or fatigue. (1) Most such people would probably seek out conventional doctors if they had indications of serious disease, such as crushing chest pain, a mass in the breast, or blood in the urine. Still, uncertainty about whether symptoms are serious could result in a harmful delay in getting treatment that has been proved effective. And some people may embrace alternative medicine exclusively, putting themselves in great danger. In this issue of the Journal, Coppes et al. describe two such instances. (16)

Also in this issue, we see that there are risks of alternative medicine in addition to that of failing to receive effective treatment. Slifman and her colleagues report a case of digitalis toxicity in a young woman who had ingested a contaminated herbal concoction. (17) Ko reports finding widespread inconsistencies and adulterations in his analysis of Asian patent medicines. (18) LoVecchio et al. report on a patient who suffered central nervous system depression after ingesting a substance sold in health-food stores as a growth hormone stimulator, (19) and Beigel and colleagues describe the puzzling clinical course of a patient in whom lead poisoning developed after he took an Indian herbal remedy for his diabetes. (20) These are without doubt simply examples of what will be a rapidly growing problem.

What about the FDA? Shouldn't it be monitoring the safety and efficacy of these remedies? Not any longer, according to the U.S. Congress. In response to the lobbying efforts of the multibillion-dollar "dietary supplement" industry, Congress in 1994 exempted their products from FDA regulation. (21,22) (Homeopathic remedies have been exempted since 1938. (23)) Since then, these products have flooded the market, subject only to the scruples of their manufacturers. They may contain the substances listed on the label in the amounts claimed, but they need not, and there is no one to prevent their sale if they don't. In analyses of ginseng products, for example, the amount of the active ingredient in each pill varied by as much as a factor of 10 among brands that were labeled as containing the same amount. (24) Some brands contained none at all. (25)

Herbal remedies may also be sold without any knowledge of their mechanism of action. In this issue of the Journal, DiPaola and his colleagues report that the herbal mixture called PC-SPES (PC for prostate cancer, and spes the Latin for "hope") has substantial estrogenic activity. (26) Yet this substance is promoted as bolstering the immune system in patients with prostate cancer that is refractory to treatment with estrogen. (27) Many men taking PC-SPES have thus received varying amounts of hormonal treatment without knowing it, some in addition to the estrogen treatments given to them by their conventional physicians.

The only legal requirement in the sale of such products is that they not be promoted as preventing or treating disease. (28) To comply with that stipulation, their labeling has risen to an art form of doublespeak (witness the name PC-SPES). Not only are they sold under the euphemistic rubric "dietary supplements," but also the medical uses for which they are sold are merely insinuated. Nevertheless, it is clear what is meant. Shark cartilage (priced in a local drugstore at more than $3 for a day's dose) is promoted on its label "to maintain proper bone and joint function," saw palmetto to "promote prostate health," and horse-chestnut seed extract to "promote... leg vein health." Anyone can walk into a health-food store and unwittingly buy PC-SPES with unknown amounts of estrogenic activity, plantain laced with digitalis, or Indian herbs contaminated with heavy metals. Caveat emptor. The FDA can intervene only after the fact, when it is shown that a product is harmful. (28)

It is time for the scientific community to stop giving alternative medicine a free ride. There cannot be two kinds of medicine— conventional and alternative. There is only medicine that has been adequately tested and medicine that has not, medicine that works and medicine that may or may not work. Once a treatment has been tested rigorously, it no longer matters whether it was considered alternative at the outset. If it is found to be reasonably safe and effective, it will be accepted. But assertions, speculation, and testimonials do not substitute for evidence. Alternative treatments should be subjected to scientific testing no less rigorous than that required for conventional treatments.

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Are Coincidences Remarkable?

Bruce Martin's excellent article "Coincidences: Remarkable or Random?" (September/October 1998) reminds me of an anecdote in Carl Sagan's *The Demon-Haunted World* (1996, p. 214n), concerning the physicist Enrico Fermi. After Fermi had joined the Manhattan Project, he heard some military officers refer to someone as a "great general." Fermi asked them to define this term. After discussion, they decided that a great general was one who had won at least five consecutive battles.

Only a few percent of generals, they said, achieve greatness. Clearly they implied that winning five consecutive battles was so improbable (like the coincidences discussed by Bruce Martin) that only an extraordinarily gifted general could achieve it.

Fermi responded by asking them to imagine that there are no great generals, that all armies are equally matched, and that a general's chance of winning a battle is always one out of two. It follows that his chance of winning five consecutive battles is 1 in 2^5, or 1/32, about 3 percent.

"You would *expect* a few percent of American generals to win five consecutive battles—purely by chance. Now, has any of them won *ten* consecutive battles . . . ?"

Robert Stanton
Professor of English Emeritus
University of Washington
Seattle, Wash.

Your readers might like to wonder why people pay so much attention to the coincidences surrounding the Lincoln-Kennedy assassinations but seemingly ignore those surrounding the Garfield-McKinley assassinations:

Both were Ohio Republicans with New York vice presidents who had been Civil War veterans. Both were assassinated by non-Wasps. Their reformer vice presidents Chester Alan Arthur and Theodore Roosevelt had the same number of letters in their names.

I suppose the records of any two randomly selected presidents would show an awful lot of such coincidences.

For those familiar with all those Lincoln-Kennedy comparisons, the one that says "Lincoln had a secretary named Kennedy and Kennedy had a secretary named Lincoln" is false. The first part of that statement is incorrect. Lincoln did not have a secretary named Kennedy

David Simon
Toronto, Canada

Bruce Martin responds:

For the reason indicated by Simon, the presidential secretary comparison was not included in my article. While president Kennedy's secretary was Evelyn Lincoln, president Lincoln's secretary was in fact John Nicolay.

Numerological Opportunity?

What a golden opportunity you missed!

When Underwood Dudley's article on numerology and the preponderance of "57" in American history (September/October) was "continued on page 59" it would have been a trivial effort in page makeup to have placed the continuation text a mere two pages earlier.

How many would have noticed is unknowable, but those who did would most certainly have felt a little *frisson* of the power of "coincidence" when they got to the bottom of page 31.

John D. Stackpole
Fort Washington, Md.

I enjoyed the article about numerology, but was disappointed it was continued on page 59 instead of 57. What a missed opportunity!

Mark Rivkin
Tucker, Ga.

Dudley (p.30) finishes the discussion of random numbers with the indication that the sequence of bases in our DNA results from a comparable random process. That is far from true. The DNA we get has some random components, such as which member of each of the twenty-three pair of chromosomes we receive from each parent (except for the X/Y pair). But there are many restrictions. They include: 1) who our parents were and what their ancestry was, 2) the mechanism by which reproductive cells are formed and combine, and 3) the nonfunctional possibilities that are usually eliminated before birth occurs, but are occasionally seen as post-birth lethal mutation. More important, it seems likely that most of these nonfunctional DNA sequences were eliminated from the pre-genome pool at the time the chemistry of pre-biology was evolving into biology. There is also evidence that certain sequences of DNA bases are chemically more probable than others. It is the invalid concept of randomness that the anti-evolutionists use to argue that we could not be what we are by a random process. Certainly, natural selection is not random.

John E. Hendrix
Professor, Plant Physiology
Colorado State University
Fort Collins, Colo.

Calculated Risks?

The main point of K. C. Cole's "Calculated Risks" (SI September/October 1998) is correct; society's assessments of risks are often unrealistic. The article, however, contains some illustrations that are questionable. It suggests that marriage is to be encouraged because it promotes health, but it is more plausible to argue that causation goes the other way: people who are healthy are usually more attractive in appearance and personality than those who are not, and are therefore more likely to be married.

No doubt there are more deaths from suicide than from asbestos, but it is not clear how society could "go after" suicide. Antidepressant drugs are available to those who want them. For people who are terminally ill and living in misery, suicide can be an entirely rational choice. I would not care to see the creation of a government agency empowered to interfere with what should be a personal and private decision.

More prenatal care for women belonging to the "underclass" would probably be much less effective than a change of lifestyle. Mothers who use alcohol, crack, or other drugs, eat unhealthy diets, and neglect basic hygiene are likely to produce sick or defective offspring no matter how many doctors are assigned to them. But it is, admittedly, difficult to find ways of changing their behavior.

David A. Shotwell
Alpine, Texas

The otherwise excellent article by K. C. Cole contributes to the popular innumeracy of calling both the arithmetical mean and the

median the average. Typically, the percentage of the population below the mean is not exactly 50 percent. For example, over 90 percent of Americans have committed less than the per capita mean number of murders.

Norman H. Sleep
Department of Geophysics
Stanford University
Stanford, Calif.

I would like to respond to the comment in K. C. Cole's article "Calculated Risks" about minimizing the risk of asbestos exposure. Her choice of wording "If we put our money on the real killers, we'd go after suicide, not asbestos" does not take into account those who regularly inhaled high concentrations of this substance mostly as a result of their employment—people who cut and worked with sheets of asbestos, like my father, ship yard workers, and even auto brake mechanics.

I think what the article meant to convey was that for the general population, who may have brief and minimal exposure to asbestos, it does not represent a significant threat. However to imply that there is very little danger in asbestos exposure is false and misleading.

Two years ago my father died a very painful death as a result of his asbestos exposure. Would she really want us to use asbestos like we did twenty years ago?

Stuart Hirsch
Columbia, Md.

K. C. Cole's enlightening dissertation on calculated risk may be a calculated risk for some readers, especially for those in areas plagued by Lyme disease. She mentioned wearing combat fatigues to, I presume, ward off disease-carrying ticks. Camouflage fatigues are a safe haven for these pests. The wildlife people recommend wearing light-colored clothing when one frolics through the flora. Then these tiny insects can be easily seen and removed, lowering the risk of contracting Lyme disease.

James A. Carroll
Green Creek, N.J.

In a single paragraph near the end of "Calculated Risks," K. C. Cole unwittingly reveals her own susceptibility to fallacious argument and twisted statistics. Quoting Roger Simon's implication that the NRA wishes to suppress research and thereby relieve the public of its "moral obligation" to outlaw ownership, she writes: "The National Rifle Association lobbied successfully to eliminate the program at the Centers for Disease Control that keeps track of gun deaths."

As a discussion of the psychological factors underlying the inability or unwillingness of most people to perform accurate risk assessment, the article was entertaining and comprehensive—but it might have been improved by discussion of a closely related phenomenon: the conscious exploitation of this well-known statistical "blind spot" for express political advocacy.

For examples of this, it's hard to beat the CDC and other organizations that advocate gun prohibition. The CDC's particular angle is to portray guns as "disease" vectors, like plague rats or malarial mosquitoes, casting gun ownership as a "public health" issue. (Of course, only privately owned guns are infectious; the government has healthy guns.)

In fact, gun accidents are at an all-time low. In 1904, there were over 4,000 gun accidents; 1930: 3,200; 1995: 1,400. Allowing for increased population and rates of gun ownership, this represents an 85 percent reduction (National Safety Council, 1995). Gun accidents represent less than 1 percent of all accidental deaths—far behind car accidents, drowning, fire, and even choking. So how can gun control advocates justify their claims?

- Conflating accidents and crimes. Most "gun deaths" are suicides or murders. Deliberate acts, by definition, have nothing to do with safety! Yet crime statistics are used to show that guns are "unsafe."
- Misleading definition of terms. Ads picture a White toddler, while statistics in the same ad come from a study where "child" means under 25, and nearly all the shootings involve Black, 19- to 24-year-old gang members.
- Using percentages when absolute numbers aren't scary enough, and vice versa.
- Outright lying, knowing the press will parrot their figures uncritically. (e.g. "14 children a day are killed by handgun abuse every day," from Handgun Control Incorporated [HCI]. That would be 5,100, more than twenty times the actual number).

Jeffrey Bennett
Liberty, Pa.

K. C. Cole implies that the National Rifle Association would prefer to put its head in the sand with regard to gun deaths rather than understand and do something about the real causes of crime and accidents. She even implies that the NRA's opposition to the Centers for Disease Control's now-defunct program for keeping track of gun deaths was immoral. Unfortunately she doesn't say why the NRA fought against the CDC program and why the NRA eventually prevailed.

The CDC program was spearheaded by a politically motivated minority of gun-hating zealots within the ranks of the CDC. As was later shown by the NRA, the CDC's approach was a classic example of lying with statistics, the very illogic SI warns its readers to be on the watch for! Among other things, the CDC attempted to compare out-of-context, automobile *accident* statistics with the combined total of all gun deaths, which included justifiable self-defense shootings. The NRA prevailed because they were able to demonstrate serious flaws in the CDC study. The CDC study simply didn't hold water.

On the contrary, the NRA is deeply concerned with firearm safety and has been for over a hundred years.

As a member of the NRA and CSICOP, I can say that both organizations have much in common. Each is a bastion of logic and reason in a world of illogic and unreason.

Howard Gantz
Thousand Oaks, Calif.

Editor's Note: We received six other letters making points similar to those in the previous two letters.

Science, Religion, and Believing in Weird Things

Wayne Anderson's article "Why Would People *Not* Believe Weird Things?" (September/October 1998) made the interesting and important point that members of our society are generally ill-prepared to distinguish between the relative value of the various sets of religious, pseudoscientific, and scientific beliefs with which they are confronted. One reason put forth by the author is that the acceptance of Biblical miracles predisposes society to be credulous toward contemporary paranormal and pseudoscientific claims.

Unfortunately, in making this point, the author recites a sampling of Biblical miracles in a belittling tone, then pejoratively characterizes them as "far-fetched," "silly," and "unreasonable," and as something which

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"might be entertaining in a *Star Wars* movie." He states, "Their claim to truth should make any thinking person blanch."

As persons active in promoting the skeptic movement on the local, national, and international level, we wish it to be publicly known that we consider skepticism to be pro-science, not anti-religion, and that such rhetoric is both unnecessary and counterproductive to promoting critical thinking among the general public. Signers of this letter include believing skeptics, non-believing skeptics, and those in-between and undecided. They are troubled by the writer's automatic equation of all Christianity with Biblical literalism and find this both inaccurate and unnecessarily divisive. All agree that regardless of their personal views on the validity of the statements, the same ideas could have and should have been expressed in a less inflammatory manner.

Moreover, Mr. Anderson does not properly distinguish between faith and knowledge. He talks about Christians believing that Jesus walked on water based upon flimsy evidence. This is wrong—most Christians who believe this believe it upon faith. (By contrast if anyone claimed possession of testable evidence proving Jesus walked on water, their claim would certainly be amenable to skeptical analysis.) The content of beliefs, whether religious, New Age, or scientific, is irrelevant. What matters is whether a belief is based upon faith or upon logic and evidence. If a claim is based upon faith then our role as skeptics is to label it as such, and to point out that faith is outside the realm of science and can only be held by personal choice. If a claim is based upon evidence, then the full weight of skepticism can, and should, be brought to bear.

The signers feel Mr. Anderson's article is unintentionally harmful to skepticism, because it criticizes religious belief based upon a scientific standard. Such behavior tends to blur the necessary boundary between science, which deals with testable claims about the physical world, and religion, which deals with faith and intangible questions such as the meaning of life. Making such a distinction clear is critical to the mission of CSICOP and the logical skeptical groups to promote scientific thinking in a public arena.

Daniel Barnett, David Bloomberg, Tim Holmes, Peter Huston, Paul Jaffe, Eric Krieg, Scott Lilienfeld, Jim Lippard, Rebecca Long, Lori Marino, Rick Moen, Steven Novella, Béla Scheiber, and Michael Sofka *(Signers' organizations and cities omitted by editor for space.)*

Too often we skeptics shy away from criticizing mainline religions, and that includes articles written for SKEPTICAL INQUIRER. Thus it was refreshing to read Wayne R. Anderson's article "Why Would People *Not* Believe Weird Things?" in which he pointed out that claims of religion are just as weird as those of pseudoscience.

Edgar Pearlstein
Lincoln, Neb.

Bingo, Mr. Anderson! Your assessment that science makes all the demands of faith that religion does but without the benefits of coddled pride or oversold salvation is a point too long ignored by the scientific community. This tendency can be blamed in part on the somewhat incestuous nature of living and working within a closed academic or professional system and losing the perceptual vitality necessary to appreciate particular problems from out-worldly viewpoints.

Not fully apprehended, either, is the way in which substantial scientific information is so poorly disseminated to the public. We are supplied with fetching displays of experimental phenomena—but with very little information about science as an institution. Religion does its communicating superbly well, offering dynamic rhetoric in a manner easily comprehended by the public through widely accessible channels, many of them owned by religious interests. Why doesn't science, or the academy in general, establish at least one major cable channel all its own instead of having to rely on the vagaries of commercial operations or the controversially reticent PBS. After all, carrying Mr. Anderson's observations a little further, if you are going to attack pseudoscience and New Age hawkery, you must also attack Biblical authority with equal vigor, otherwise you are rightly perceived as exclusory in your criticism, an enormous mistake in informational integrity . . . .

Carl Archibald
Salem, Ore.

I very much enjoyed Wayne Anderson's piece. He added a much-needed perspective often missed or ignored by skeptics. If 90 percent of Americans believe in God, and a majority believe a wide range of pseudoscientific claims, it is useful to ask why. Too often skeptics (of which I am one) merely express their outrage or dismay at all of those "irrational" people out there, without giving thought to why those beliefs are held or admitting that the decision to believe pseudoscientific claims is understandable. One minor point: Anderson concludes that science education is needed to improve people's ability to distinguish between real science and pseudoscience. Although I agree with him, I think what is most needed is to improve people's "faith" in science. As Anderson points out, for most lay people, many scientific claims must be accepted on faith. It is, therefore, critical that the scientific community be trusted and believed in. This is the real challenge. It is not so much a battle to teach people scientific methods (although this is part of it) but a battle of credibility: who will you choose to believe? It is this battle that science is losing. Perhaps the best way to win is not to attack "irrational beliefs" but to remind people how successful science has been and how much it has improved our lives. Science teachers are important, but what science really needs are evangelists!

Alan S. Miller
Professor, Department of
Behavioral Sciences
Hokkaido University, Japan

Wayne R. Anderson's article asks why people should be expected to disbelieve weird things, such as religions, astrology, UFOs, alien abductions, dowsing, reincarnation, etc. to be replaced by rational science, in view of the increasingly counter-commonsensical and arcane nature of cutting-edge cosmology, quantum theory, and evolutionary thought.

To simplify this argument, we may concede that much of pseudoscience serves as a surrogate for religious beliefs. Sigmund Freud in *Civilization and its Discontents* holds that man's religious need derives from infant helplessness and the longing for a father's protection, a feeling sustained into adulthood by fear of the superior power of fate. We long to return to that secure, predictable world of early childhood where a father (or mother) appears all-powerful and all-knowing, and as adults we seek a connection with a powerful entity that is concerned with us as individuals and makes our lives more significant, providing needed existential comfort.

Both UFO and astrology enthusiasts are driven by a presumed connection with cosmic forces. Religions tell us we are all important to God, with promised benefits accruing mainly in the world to come, a clever

manipulation; but as Anderson remarks, "their claim to truth should make any thinking person blanch." CSICOP has been saying the same for pseudosciences, with proof supporting its assertions.

Both Carl Sagan and Richard Dawkins make the case that the mystery and wonder of science should be enough for us, and that we should connect with what is already here in the material world before concluding we need something more (Dawkins, SI, Vol.22 No.2). Sagan, when asked to explain his enthusiasm for science, said "When you're in love you want to tell the world"(Cooper, SI, Vol.22 No.2). Both remarks share a religious tone. Both religion and science seek certainty about reality but have dissimilar groundings; both share a compulsion to explain reality to us.

Anderson's excellent summaries of *string theory, M-theory, many worlds, entangled particles,* etc. defy common sense, yet these theories represent the epitome of scientific rationality, leading the eminent American philosopher Richard Rorty to note the parallels between science and religion. The Enlightenment held that truths must cohere into a unifying whole, whereas postmodern thought claims we sometimes need to hold two contradictory views at once, setting aside any idea of truth, as some poets do where ambiguity and metaphor replace the idea of absolute truth.

The revered skeptic Martin Gardner admits an idiosyncratic belief in a private God (SI, Vol.22 No.2) that provides him consolation and helps keep despair at bay. While some, including myself, may be unable to share this consolatory belief, this in no way diminishes our respect for Martin Gardner's intellect or contributions to the world. Should he tell us he is privy to God's mind and knows what kind of life we should all lead, this respect would suffer. I am confident this will not occur in his case, but I am not so confident about many others.

Private religious belief or disbelief is acceptable in our democratic society, but when it moves into the public arena as absolute truth, criticism is warranted. . . .

Edwin D. Cox
Chapel Hill, N.C.

Thanks for printing Wayne R. Anderson's article, "Why Would People *Not* Believe Weird Things?," which expressed something I've been feeling for years: Some scientific theories require as great an act of faith to the average layman as anything you'll read in the Bible, the horoscope, or the *Globe*.

I will admit to being a Newtonian dinosaur, who occasionally tries to lumber into the modern age of quantum physics. I'll pick up an article or book or watch a PBS special, and try to understand what this string theory is about, or how the entire universe could exist in a tiny speck of energy that becomes the Big Bang, or how you can have parallel universes in the same space. I invariably retreat, feeling oppressed by my walnut-sized reptilian brain and wondering how long before the mammals push us out.

And yet, I am not that stupid. I've got two degrees, and was just shy of a 4.0 on the last one, which involved a lot of heavy-duty math and computer courses. I have a good head for logic, and a mind that is open enough to explore new ideas that make sense.

But they have to make sense. They have to be explained in simple everyday language so we can see and understand the concept and explain it ourselves when we debate it with our friends. Otherwise, it's just the same sort of techno-babble that we hear on the *Star Trek* series.

In closing, I will humbly admit that the average physicist has a brilliant intellect that far outshines my own. But I am still left with the uncomfortable slogan: Steven Hawking said, "I believe it and that settles it." Except I never was much good in the faith department.

Bev Kaufman
Sunrise, Fla.

Wayne R. Anderson's discerning questions on beliefs in weird things was unquestionably the outstanding article in that issue. Modern attempts to find one theory for everything are indeed on the border of religion. Quarks, eleven dimensions (not ten) and unlimited multiple universes are all tainted with the same sin of unfalsifiability, the well-known mark of religion. There is no way of proving or disproving (by scientific, physical detection) the existence of any of these entities.

But that is neither here nor there. We certainly may use them for relating cause and effect. The fact that not all are strictly essential or even sufficient for a particular theory is forgivable in the same sense that we give absolution to violators of religious morality, which also works more often than not. However to make it all acceptably liberal we should extend to both disciplines the property of fallibility and the uncertainty in detecting the Truth with a capital T, carefully and mercifully sidestepped by Anderson.

How now can we protect the poor benighted layman who, with the help of the media, the Internet, and other sources of misinformation, cannot distinguish science from religion, when scientists who should know better cannot separate science from science fiction or even pseudoscience (Read *Visions* by Michio Kaku to see how a scientist can hold imagination higher than knowledge.). . . .

Bernard Smith
Boca Raton, Fla.

What's Going On at Temple University?

Martin Gardner's column, appropriately titled, "What's Going On at Temple University?" (September/October 1998) was on target. Under the guise of academic freedom, all sorts of nonsense has been produced at Temple, with David Jacobs and his alien abduction theories as the weirdest. Gardner did not mention, though, Temple University's role in also promoting one of the most pernicious cults of pseudohistory and pseudoscience, that of "Afrocentrism."

Professor Molefi Kete Asante chaired the African Studies Department (or the "Department of Africology" as they now wish to call it) at Temple from 1985 to 1997. He quickly became one of the nation's leading proponents of Afrocentrism, which claims that the ancient Egyptians were Black and that the Greeks stole from them the cultural basis of Western Civilization. Professor Asante and his colleagues specifically reject Western traditions of scholarship and evidence, using myths and religious rituals to reconstruct bogus histories designed to increase the self-esteem of Black Americans. The most dangerous aspect of Afrocentrism has been its introduction into the curricula of many urban schools, especially in the "African-American Baseline Essays" (SI, September/October 1995). Absurdities are taught to children within the framework of Afrocentrism, and the teachers gain their pedagogical inspiration from lionized professors in higher education. Temple University is helping to create a sad and tragic legacy in the Black American community, where true knowledge is sacrificed to a misguided racial consciousness.

Mark A. Wilson
Professor of geology
The College of Wooster
Wooster, Ohio

In his article on "What's Going On At Temple University?" (September/October 1998), Martin Gardner misses the point about Temple's Center for Frontier Sciences and the important function it serves.

The Center does not conduct research. The rationale for its existence is to provide a global forum for the exchange of information and intellectual inquiry into scientific, medical, and technological issues which are considered outside the mainstream. A fundamental reason for establishing the Center in 1987 was a belief that "the frontier science of today may become the mainstream science of tomorrow."

On its advisory and editorial boards are distinguished researchers, scientists, physicians, theoreticians, and engineers from throughout the world—all of whom agree with the Center's purpose of being a sounding board for new inquiries and new ideas. They include faculty members at Oxford University, Harvard University, University of Pennsylvania, Duke University, Nagaoka University of Technology, University of Arizona, University of Milano, and University of Bath.

The Center does not endorse research or put any seal of approval on peer-reviewed articles in its journal, *Frontier Perspectives*. It does operate, however, in a lively interdisciplinary framework in which the questions may be just as important as the answers.

It is unfortunate that Gardner does not understand the Center's mission. But if he believes that a university should not foster unfettered thinking and inquiry, then the real targets in his article are the academy itself and the free exchange of ideas.

Nancy Kolenda
Director
Center for Frontier Sciences
Temple University.

Martin Gardner replies:

It would be helpful if Temple University's Center for Frontier Sciences had a director who was a scientist. Director Nancy Kolenda, an accountant, fails completely to comprehend the distinction between reputable frontier science and crank science. To feature articles defending homeopathy, dowsing, Tarot card reading, and the notion that physical ills are mental delusions is no different from publishing articles defending palmistry, phrenology, numerology, and Velikovsky's crazy cosmology.

It is a great embarrassment to a distinguished university and its scientists that the chairman of Temple's board of trustees would squander $100,000 a year on a center and its periodical that contribute absolutely nothing to the progress of science.

A small part of Martin Gardner's article in the September/October 1998 SI reflects on, in his words, the "funniest" paper that was published in Vol. 7, No. 1, 1998 of *Frontier Perspectives*. He refers here to my article "On the Nature of Tarot," which appeared in the Invited Opinion section of this periodical, a section devoted to works which, by virtue of their being original, and usually interdisciplinary, ideas, afford the authors the privilege of publication without the usual peer-review procedure.

While listing—randomly and without paying attention to the inferential process permeating the article in question—some critical points of my paper, Gardner doesn't make the slightest effort to attempt to refute any of my arguments. If he disagrees with propositions appearing in my article, why didn't he raise any objections instead of limiting his reasoning to a single epithet, "funniest," with regard to my paper? I was looking forward to the opportunity to attract the scientific scrutiny that, I believe, is the purpose of the Invited Opinion section, but Mr. Gardner a priori crossed himself out of such a promising dialogue. He seems to be unaware of the contemporary debate on such issues as backward causation, or effect of imagery on concept formation, or philosophical implications of the puzzles of space-time from viewpoints of nowhere and nowhen, or the current discourse in the field of experimental metaphysics, or the ontology of virtual and actual. If, as it seems to me, the phenomenon of Tarot plays even a small and marginal role in the aforementioned conceptual explorations, it deserves attention and respect—something that Mr. Gardner, despite his age and scholarship, has still to learn to practice!

Inna Semetsky
Teachers College
Columbia University
New York, N.Y.

Martin Gardner replies:

Inna Semetsky is irked because I called her defense of Tarot card reading "funny," without giving my reasons for rejecting such fortune telling. I would no more waste space trying to "refute" Tarot card reading than I would waste space trying to refute palmistry or tea-leaf reading. Ms. Semetsky's letter, with all its references to modern physics, is even funnier than her article. That a magazine claiming to discuss matters on the "frontiers" of scientific research would publish her paper is, however, not funny, but sad.

As witnesses and victims of Temple University's Center for Frontier Science we were glad to see Martin Gardner's exposé. We too have been wondering what is going on at Temple and were only surprised about the extent of the duplicity and pseudoscience.

In 1994 we submitted our eagerly solicited article ("Microbial pleiomorphy: prerequisite for cell differentiation and animal communities") as a good faith response to Beverly Rubik's invitation to the "Pleiomorphy Conference." The term refers to the microbiological fact that bacteria and protists take on altered shapes and sizes depending on environmental conditions and hence many live forms of these tiny organisms go unrecognized.

The Philadelphia conference (autumn of 1993 which only L.M. attended) coaxed some remarkable genuine scientists (Gerald Domingue, Shyh-Ching Lo, and others) to join people whom L.M. suspected were charlatans. Suffice it to say that five years later (after much work and expense in manuscript preparation) in spite of our frequent inquiries and their requests for continued patience, the conference proceedings are of course unpublished. Apparently Rubik (who has founded a second center, the Institute for Frontier Science in California) and Kolenda no longer speak to each other or communicate in any way.

We are grateful to the intrepid and erudite Gardner for bringing to our attention the depth of the problem. We will now stop assuming that our chapter contribution will ever be printed and we will remove the title from our curricula vitae.

Lynn Margulis
Distinguished University Professor
Department of Geosciences
Michael Dolan, Ph.D. candidate
Organismic and Evolutionary Biology
University of Massachusetts, Amherst

My one face-to-face meeting with David Jacobs goes back to 1979 when I attended a talk on UFOs by him at Loyola College in

Baltimore, where I then lived. Within moments of commencing his presentation, I raised my hand to offer a correction. After doing so a second time a few moments later, I asked if future such comments should be held until the end. A game trouper, Jacobs invited me to raise my hand at will, and I must have done so a dozen times during the course of his talk (I was apparently the only well-versed attendee, and the only one with questions and comments).

The error I remember most vividly related to the famous 1971 Delphos, Kansas, "UFO landing trace" case, in which a ring of white substance purported to be UFO-propulsion residue (but later determined to be natural organic matter) was allegedly left behind on the soil, which had been muddied by recent rains (see chapter 28 in Philip Klass's *UFOs Explained*). In Jacobs's inexplicable mangling of the tale, the white ring became "the only area of the yard where the snow didn't melt."

What distinguishes Jacobs's research from that of the other "UFO abductionists" are his academic credentials in the field of historical truth. Jacobs may be a fine college history teacher, but what he taught me that day some nineteen years ago only serves to reinforce my skepticism of the historical reality of "UFO abductions."

Gary P. Posner, M.D.
founder, Tampa Bay Skeptics
Tampa Bay, Fla.
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Starkle, Starkle

Judith Hays's article "Starkle, Starkle, Little Twink" (SI, September/October 1998) offers an effective way to challenge belief in astrology, by asking simple questions that reveal the inconsistencies and errors of astrology. Many of the questions she suggests, however, can be countered by astrologers because they only concern date and time of birth, not location.

A slightly different line of questioning may be more effective, because it concerns the broad nature of astrology: ask how astrology is different from racial bigotry. Racial bigots believe that certain inherent properties of a human being (skin color and ethnic origin) reveal certain characteristics of that human being (intellectual ability, romantic and sexual inclinations, ethical and moral tendencies and general prospects for the future). Astrologers believe that certain inherent properties of a human being (date, time and place of birth) reveal certain characteristics of that human being (intellectual ability, romantic and sexual inclinations, ethical and moral tendencies, and general prospects for the future).

Aren't astrologers assessing people on grounds similar to racial bigotry?

Gregory Vogel
gvogel@comp.uark.edu

Judith Hayes brought back to me the conversations I used to have about thirty years ago with young folks who had become enamored of astrology. I used to try some of her approaches, but none of them could "prove" that astrology is nonsense. So I developed this one:

> "I am perfectly willing to admit that there may indeed be a few individuals who have a special power to see and understand matters hidden from the rest of us, but I have yet to meet such a person and I don't think that the horoscope column in the daily newspaper is prepared by such a person."

The typical response was, "Oh." End of conversation about astrology.

Incidentally, many of those who used to go for astrology are now enthusiastic about the Myers-Briggs Type indicator. It has the advantage of having a "scientific" basis for separating people into sixteen different personality types. But it is nonsense too.

Harold J. Brownlee
Chatham, N.J.

In response to my article about astrology, "Starkle, Starkle, Little Twink," I received a great deal of favorable mail (thank you!) and, surprisingly, an equal number of inquiries about the origin of the ditty I quoted in the title. People wanted to know the full text, the author and the date. Alas, I had no idea! I knew only the first two lines and hadn't a clue as to the author.

Apparently, though, a great many people had read that same verse and could remember bits and pieces but not the whole thing hearing it as long ago as 1938. So, determined now to track this thing down, I searched the Net, sent out e-mails, and phoned the library reference desk. The results were mixed. There are several versions of this little poem floating around out there. I couldn't find the author's name, but the following is my best guess as to the original title and text:

Sotally Tober
Starkle, starkle, little twink,
Who the hell you are I think?
I'm not under what they call
The affluence of incohol.
I'm not drunk as thinkle peep,
I'm just a little slort of sheep.
Tee many martoonies make a guy
Feel so foolish—don't know why.
Really don't know who's me yet,
The drunker I stay the longer I get;
So one more fink to drill by cup,
I've all day sober to Sunday up.

If anyone knows the author and date of this, and whether or not the text is correct, please let me know. I am truly interested, as are many others!

Besides, such poetic genius deserves recognition. Is this silly? Of course it is. Is this important? Of course it is! In a world of disintegrating governments and terrorist bombs, you just have to take the time, now and again, to stop and search for Starkles.

Judith Hayes
jhayes@goldrush.com
Valley Springs, Calif.

Scientific Psychology

Henry Schlinger, Jr., in "Of Planets and Cognitions" (September/October), begins with a valid point. The social sciences, and psychology in particular, assume the existence of unobservable processes, but lack an experimentally verified body of laws to justify these assumptions. Dr. Schlinger wants psychology to be "a natural science of behavior," eschewing reliance on "unobservable phenomena," such as ". . . the mind, the self, personality, memory, and consciousness."

He ends with a call to arms for psychologists to follow in the footsteps of Galileo and Newton by creating this new school of scientific psychology, based solely on the observation of cause and effect. The problem is that it already exists. It's called behaviorism. J.B. Watson wrote the same essay in 1913 ("Psychology as the Behaviorist Sees it." *Psychological Review*, vol. 20, 1913). The techniques of this movement have proven highly effective in certain areas, but no one has yet demonstrated a way to explain people's subjective experience without recourse to "unobservable" phenomena, such as thoughts, moods, intentions, and wishes. The weaker form of behaviorism states that such things are not fit objects of study. The more radical form asserts that they are illu-

sory. This is not skepticism, it's solipsism.

Adam Rosenblatt, M.D.
Assistant professor of psychiatry
John Hopkins School of Medicine
Baltimore, Md.

In Defense of Psychotherapy

I am sorry to find that Robert Baker's review of *Therapeutic Madness,* by John I. Lynch, falls far short of the editorial standards I associate with SKEPTICAL INQUIRER. The review comes across as a diatribe by someone with an ax to grind and a personal agenda not at all consistent with application of empirical techniques to medical care.

Dr. Baker makes much of the idea that modern psychiatry does not "cure" mental illness. Modern psychiatry does not claim to "cure" mental illness, any more than internal medicine claims to "cure" hypertension or diabetes. Dr. Baker seems to want to gloss over the fact that many mental illnesses are recurrent and/or chronic, but have documented response rates to treatment as high and often higher than disorders of other organ systems. To assert that there are no published therapeutic standards, reliable and valid diagnostic tools, and generally accepted treatment techniques with documented outcome measures is to demonstrate gross ignorance of the psychiatric literature. To emphasize that mental disorders are *emotional* disorders as if completely devoid of any neurobiological basis suggests that the brain is somehow immune to the dysfunctions that afflict every other organ system in the body. Such dualism has been overwhelmingly rejected by the mainstream psychiatric and neurobiological communities. . . .

Scott D. Moore, M.D., Ph.D.
Duke University
Department of Psychiatry
Durnam, N.C.

As a psychotherapist I must object to the blanket condemnation of therapy in Robert A. Baker's review. Baker and the authors he cites base their complaints on the justified anger of a handful of disgruntled patients who've had bad experiences. Granted, there are charlatans and incompetents in the therapy field, as in any other. However, the majority help their patients immensely.

I find that most people seek help because they have trouble in relationships, can't get ahead in life, or feel depressed or anxious. For these people, a short course of therapy can bring insight, improvement, and relief.

For others, who come because of deeper difficulties, such as an inability to differentiate between self and others, projected rage or paranoia, suicidal thoughts, etc., a longer course may be necessary to provide the capacities they failed to develop in childhood (a kind of reparenting).

For still others who suffer from severe mental illnesses such as schizophrenia, major depression or bipolar disorder, medication may be necessary in addition to talk therapy, to prevent disordered thinking, bizarre behavior, or suicide. For these people, there may be no other way to survive.

Though some of the precepts of therapy are necessarily deductive, the work is basically a rational assessment of the person's strengths and weaknesses, and a thoughtful intervention to help them become happier and more productive.

Philip Bockman
New York, N.Y.

Dr. Baker's dismissive comments on the value of psychotherapy, while entertaining, do not have the support of controlled scientific research. Treatment outcome research essentially dates from Hans Eysenck's 1952 work in which he found that psychotherapy, at that time, was largely ineffective. By 1980 there was little defined improvement. Rachman and Wilson (1980) reviewed the therapeutic outcomes of psychoanalytic treatment, group therapy, behavior therapy, and cognitive-behavioral therapy and found that some slight progress had been made in the attempt to support the claims made on behalf of psychotherapy. They found, however, that the negative results still outnumbered the positive findings. They commented, however, that behavior therapy was promising, especially with respect to obsessive/compulsive disorders, and some sexual dysfunctions. Cognitive behavior therapy was also considered to be a valuable and interesting addition to the methods for assisting people. Howard et al. in 1986 found there was a growing consensus that psychotherapy was generally beneficial and that the degree of therapeutic benefit appeared to be positively related to the amount of treatment. This dose-effect relationship for psychotherapy constituted empirical support for the effectiveness of psychotherapy more than a decade ago.

In 1995, the Task Force of the Division of Clinical Psychology of the American Psychological Association published its *Training in and Dissemination of Empirically-validated Psychological Treatment: Report and Recommendations.* The Task Force identified 22 well-established treatments for 21 different disorders and another 7 probably effective treatments for the same number of disorders. Twenty of the 22 well-established treatments were/are behavioral in nature. Similarly, all but the brief psychodynamic therapies listed as probably effective were behavioral. By 1996 the Task Force added another eight well-established treatments and 19 probably effective treatments, which, with five exceptions, were behavioral in nature. Further, just last year Nathan and Gorman, in *A Guide to Treatments that Work,* confirmed that psychological treatments alone and in combination with drugs have been found effective for a wide variety of conditions. Behavioral treatments, then, have shown their effectiveness for quite a number of disorders.

The research evidence suggests that cognitively and behaviorally oriented psychotherapies can contribute to the well-being of individuals suffering from an increasing variety of syndromes. Things are not quite as bleak as suggested by Dr. Baker and there is good reason to believe that, with continued research, cognitive and behaviorally oriented psychotherapists will demonstrate further increases in their therapeutic effectiveness.

Gary W. Lea, Psy.D.
registered psychologist
Kelowna, B.C., Canada

Robert A. Baker responds:

The Letters to the Editor section is not the proper place to debate the successes and failures of either modern psychiatry or psychotherapy. In 1996 I devoted an entire book, Mind Games *(Prometheus Books), to this issue. The book itself is a thorough and annotated 477-page response and rebuttal to the good doctors Moore, Bockman, and Lea's knee-jerk reactions in defense of their trade. I recommend they read my book before hurling accusations.*

Dracula Centennial

Joe Nickell in the September/October issue mentioned that *Dracula* by Bram Stoker was published in 1891. Since a theater in the

town which I live recently celebrated the novel's hundredth anniversary with a stage production I thought that the date was a bit odd. Sure enough, my copy of the novel says that it was first published in 1897.

Michael S. Hopkins
Norman, O.K.

ABC's Automated Autos!

On September 4 ABC aired an hour-long documentary called "When Cars Attack" that purported to demonstrate that automobiles, trucks, bikes—even speedboats—sometimes have minds of their own. They can, we were told, spontaneously take over the controls from the driver and cause all sorts of mayhem. Driverless cars were shown taking off and leading the police on wild chases. A well-rehearsed female "psychiatrist" declared that "we have a 'virus' out there spreading evil throughout the automotive population."

Dozens of cleverly faked crash incidents were screened. I soon realized it was unlikely that video cameras and skilled operators could have been so conveniently available so often. However I believe that many viewers, brainwashed on a TV diet of UFOs and alien-encounters, could have been duped. The script was laced with the usual rhetorical guff: "Is it possible that . . ?" "Can there be . . ?" "Do these events prove . . ?" "Are the authorities conspiring to cover up . . ?" etc.

ABC covered their backsides by finally flashing up an admission that none of the events depicted were real. They provided time to read only the first few lines of a long disclaimer. A rather irresponsible bit of programming for any day other than April first, I think.

Horace T.E. Hone
Palm Coast, Fla.

Unfair to Forward

It is not like Martin Gardner to be unfair, but he is when he calls Robert Forward "a maverick physicist" and cites the titles of a few science fiction novels and the publisher's blurb for a nonfiction book as evidence of nuttiness ("Responding to Puthoff: Zero-Point Energy" September/October).

Dr. Forward spent thirty-one years at the Hughes Aircraft Company Corporate Research Laboratories, where they mostly let him pursue his own scientific interests because this paid off for them. At the time he left, he was Senior Scientist on the Director's staff. He has done important theoretical and experimental work especially in gravitation and space sciences, one of his many inventions being the rotating gravitational mass sensor. He continues to do research independently in frontier areas, often under government contract. His novels, which he writes for fun, are as solidly grounded in real science as any I know of. In his nonfiction books, he is always very careful to distinguish fact from speculation and to assess how far-out, even unlikely, a speculation is.

As a writer myself, I can assure you that authors are not responsible for their publishers' jacket copy!

As for zero-point energy, this is a subject of interest to a number of physicists, including the well-known Sidney Coleman at Harvard.

Poul Anderson
Orinda, Calif.

Homespun Pi (on Video)

In light of Dave Thomas's article on his pi April Fools joke (September/October), I'd like to note that there's more to pi than meets the face. The National Center for Science Education distributes the classic homespun video, direct from the mountain hollows of Kansas, "Institute for Pi Research." IPR staffers explain the urgent need to gain at least equal time for "Biblical, short pi" versus "modernistic, long pi," using outrageous puns, peccable logic, and deadpan delivery. The perpetrators, er, scholars are actually Kansas math professors and students. The 25-minute tape is $16 (available from NCSE at 1-800-290-6006).

John R. Cole
NCSE
El Cerrito, Calif.

GAO Roswell Report on Web

In your latest issue, you mention a General Accounting Office report about investigation of a possible government coverup concerning the records about the "Roswell Incident." This report, GAO/NSIAD-95-187, is available from the GPO Access website, http://www.access.gpo.gov, click on GAO Reports to bring up a query form. Persons can also connect to the GAO Report query form through the GAO Web page at http://www.gao.gov. This report, along with other government reports about the Roswell Incident, can be found in United States Depository libraries throughout the country.

Cindy Rosser
Government Publication Librarian

It's Smith

Am I right that, in referring to Tom W. Clark of the National Opinion Research Center, (News & Comment, September/October) Matt Nisbet meant Tom W. *Smith*?

William L. MacDonald
Associate professor of sociology
Ohio State University
Newark, Ohio

Yes, Smith *was meant.*

—Editor

The letters column is a forum for views on the matters raised in previous issues. Letters should be no more than 225 words. Due to the volume of letters, not all can be published. They should be double-spaced. Address: Letters to the Editor, SKEPTICAL INQUIRER, 944 Deer Dr. NE, Albuquerque, NM 87122.

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A NASA Hubble Space Telescope view of the faintest galaxies ever seen in the universe, taken in infrared light with the Near Infrared Camera and Multi-Object Spectrometer (NICMOS).

The picture, issued October 8, 1998, contains more than 300 galaxies having spiral, elliptical and irregular shapes. Though most of these galaxies were first seen in 1995 when Hubble was used to take a visible-light deep exposure of the same field, NICMOS uncovers many new objects. Most of these objects are too small and faint to be apparent in the full field NICMOS view.

Some of the reddest and faintest of the newly detected objects may be over 12 billion light-years away, as derived from a standard model of the universe. However, a powerful new generation of telescopes will be needed to confirrn the suspected distances of these objects.

The field of view is 2 million light-years across, at its maximum. Yet, on a cosmic scale, it represents only a thin pencil beam look across the universe. The area of sky is merely I/IOOth the apparent diameter on the full moon.

Credit: Rodger I. Thompson (University of Arizona), and NASA

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THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and disseminates factual information about the results of such inquiries to the scientific community, the media, and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues. To carry out these objectives the Committee:

- Sponsors publications
- Conducts public outreach efforts
- Maintains an international network of people and groups interested in critically examining paranormal, fringe-science, and other claims, and in contributing to consumer education
- Encourages research by objective and impartial inquiry in areas where it is needed
- Convenes conferences and meetings
- Conducts educational programs at all age levels
- Does not reject claims on a priori grounds, antecedent to inquiry, but examines them objectively and carefully

The Committee is a nonprofit scientific and educational organization. The SKEPTICAL INQUIRER is its official journal.

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